# The Canadian Medical Association Journal

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OLD SERIES VOL. XLIV
NEW SERIES VOL. V

TORONTO
MORANG & CO. LIMITED
1915

7669

The Canadian
Medical Association Journal

Vol. V. JANUARY, 1915 No. 1

# THE LIVER IN ITS RELATION TO OPERATIONS ON THE BILIARY TRACT AND THE STOMACH

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THAT the liver is a vital organ is proved by the fact that after excision of the liver animals undergo a progressive loss of energy—indicated by a progressive loss of muscular power and fall of body temperature—until death, which usually occurs within twenty-four hours.

Every impairment of the function of the liver, therefore, may not only seriously handicap the patient but may prove a serious menace to life itself. We propose in this paper to point out the possibility that the pathologic states requiring operation on the stomach or biliary passages; or the effect of the operation and the anesthetic; or the combination of these factors may so impair the liver function as to jeopardize or even kill the patient.

Every surgeon probably has performed apparently successful operations on the stomach and the biliary passages of patients weakened by disease, by obstruction, or by starvation. At the close of the operation the prognosis may seem promising but the following postoperative picture soon begins to develop: the patient becomes increasingly apathetic; his energy is slowly depleted; though tired and weak, he cannot sleep; his tongue becomes increasingly dry; the pulse gradually rises and its volume steadily decreases; bile is suppressed; nourishment is refused; the patient's demeanor is cheerless and despondent. The patient seems to be steadily sinking in the quicksand of some fundamental failure of normal metabolism. No means suffice to change the course of

Read at the annual meeting of the Canadian Medical Association, St. John, N.B., July 8th, 1914.

events. The patient either gradually recovers or else he gradually becomes first delirious, and then unconscious until death.

This is the familiar picture after operations on patients starved because of pyloric obstruction, or because of protracted vomiting from any cause; or after operations on patients exhausted by chronic empyema of the gall-bladder or by long continued infections from common duct stones. The temperature and pulse of these starved patients may be normal. If the prognosis be based on pulse and temperature alone, therefore, the greatest errors may be made.

I did not realize the full significance of the fundamental metabolic conditions in these cases before I made use of the transfusion of blood in the case of a patient in an advanced stage of starvation resulting from pyloric obstruction. Blood transfusion carried this patient through the operation with an efficient circulation—with pink lips even—which was maintained after the operation also. But the early promise of success disappeared as the metabolic destruction caused the picture to change. In spite of the good circulation the patient declined through increasing apathy and progressive somnolence to unconsciousness and death. I have seen this metabolic quicksand inaugurate the same fatal sequence after long delayed operations upon emaciated, starved, common-duct cases, especially when the duct was packed with stones; and after the most careful explorations in advanced cases of cancer of the stomach. Happily the fatal sequel is rare, but many patients having wider margins of safety sail perilously near the rocks.

It seemed to me of vital importance to find the explanation of these phenomena; and to discover by what means the slender margin of safety in these cases may be preserved or perchance widened. The key to both problems was furnished by certain experiments in progress in my laboratory which were being carried on to discover what tissues and organs of the body were concerned in the transformation of the energy acquired from the environment into energy available for the needs of the body. In these experiments histologic examinations were made of every organ and tissue in animals which had been subjected to prolonged insomnia; to infection; to fear; to physical injury under anesthesia. In every case histologic changes were noted in three organs only, the brain, the suprarenals, and the liver. In each of these organs the cells became vacuolated and shrunken, the nuclei became misshapen and some nuclei disappeared. In proportion to the intensity of the stimulus and the length of time the stimulus was applied

the number of altered cells and the degree of disintegration increased. In the case of the liver, after prolonged stimulation, the cells stained poorly, the cytoplasm was vacuolated, the nuclei were crenated, and the cell membranes were irregular, the most marked changes occurring in the cells nearest the periphery of the lobules.

That the histologic changes in the liver are not due to metabolism or to toxic products but that they are "work" changes incident to the conversion of latent into kinetic energy and that the brain, the suprarenals, and the liver are interdependent is proved by the facts, (1) that the average duration of life after excision of the liver is about the same as after adrenalectomy—approximately eighteen hours; and (2) that the amount of glycogen in the liver was diminished in those experiments in which there was evidence of brain-suprarenal activity.

From these premises we must consider that the brain, the suprarenals, and the liver are mutally dependent upon each other in the conversion of latent into kinetic energy.

Prominent among the products of this transformation of latent into kinetic energy are acids. We may say that every motion, every emotion, every injury, every physical exertion, every degree of fever, every reaction to infection or to auto-intoxication, every respiratory movement, every heart beat, produces an acid. Under normal conditions these acids are neutralized into harmless compounds which are eliminated by the kidney, so that under normal conditions the body tissues and fluids are for the most part slightly alkaline. If every activity of the body produces acidity in a greater or less degree, it is vitally necessary for the body to maintain a large margin of safety against acidosis by the presence of alkaline salts and bases, which are derived from food. Experiments have shown that for the maintenance of its normal state of slight alkalinity, the body is dependent primarily upon the liver and secondarily upon the suprarenals. When the liver is excised the blood soon loses its slight alkalinity and in a few hours becomes acid. When the suprarenals are excised the alkalinity of the blood is maintained for a longer period—perhaps twice as long—but it then becomes acid, and in each case the acidity of the blood is the close precursor of death. The excision of no other organ in the body produces this tendency to immediate acidosis.

We cannot dwell here upon other experimental observations which show the relative activities of the liver and the suprarenals in this neutralizing process nor the additional evidence that the liver and the adrenals are directly controlled by the brain, which

also controls the transformation of energy, which in turn as we have already stated, always produces acidity; we will merely recapitulate by saying that the harder the body is driven by any stimulus, the more rapidly will latent energy be transformed into kinetic energy. The more rapid the transformation of energy,—the greater the production of acid. The greater the production of acid, the greater also the strain upon the power of neutralization possessed by the liver and the suprarenals, and the greater the drain upon the body's store of alkalies and bases. When the liver and the suprarenals are overtaxed and the alkalies and bases are exhausted, the state of acidosis is reached.

Still another fact established by laboratory experimentation has an important bearing upon our problem—especially as it applies to common-duct operations. The liver performs its function in part through hormone action and in part through direct innervation. It is curious that for the performance of at least a part of its function it is necessary for the liver to have a simultaneous hormone and nerve stimulation. Now the nerve supply of the liver is derived from the sympathetic system, the nerve fibres passing along the blood vessels and the common duct. As during the processes of evolution these nerves have been thus abundantly sheltered against injury, they have not evolved physical qualities for their protection as have the peripheral nerves. In the course of common-duct operations performed by an operator who is unaware of this grave danger, the nerve supply to the liver will be more or less blocked by the trauma of the operation. If the block be light and the patient have sufficient endurance, the temporary loss of liver function will be safely bridged; on the other hand, the more severe the trauma of the nerves, the more completely will the nerves be blocked and the longer will that block last. This conclusion corresponds exactly with our clinical facts and makes it evident that surgery has been riding rough shod over an extremely vulnerable mechanism.

Another factor which has a vital bearing upon the treatment of the class of patients we are considering is *the anæsthetic.* Clinically it has long been recognized that when a patient is in a state of exhaustion resulting from infection, from injury, from shock, from starvation, from hemorrhage—from any cause whatsoever, he may never recover consciousness after the administration of a general anæsthetic. In a Hungarian reference, the title of which I do not recollect at the moment, it is shown that starved dogs inevitably die after inhalation anæsthesia. Clinicians know well

how unsafe it is to give a general anæsthetic of any kind to a patient on the verge of acidosis. A patient with chronic vomiting, with or without chronic pyloric obstruction, with an acetone odour of the breath, with peculiarly pink lips and dry tongue and mouth, will in all probability never regain consciousness after being anæsthetized. The aged not infrequently die under even a short anæsthesia.

Why do not these patients recover? If the patient has the power of consciousness before the anæsthetic is administered, what happened during the anæsthesia to make it impossible for the patient to regain consciousness? We have already referred to the acid-producing power of stimuli. Shall we conclude therefore that the trauma of the operation alone may have pushed beyond the margin of safety the neutralizing powers of the body already taxed by preëxisting conditions; or is the anæsthetic itself a factor in producing the fatal result?

To answer this question Dr. Menten in my laboratory made for me observations of the H-ion concentration of the blood under various conditions—the H-ion concentration being an index of the acidity of the blood. H-ion concentration tests were made after the application of many kinds of stimuli, the results of which confirmed the postulate which we have already stated, that acidity is the result of the activation of the body by any adequate stimulus. The blood was then tested to determine the H-ion concentration in ether anæsthesia, in nitrous oxid anæsthesia and after the administration of alcohol and other stimulants and of morphin. Both ether and nitrous oxid produced a marked increase in the H-ion concentration, that is, both produced acidity in the blood. After coming out from the anæsthetic this acidity was neutralized by the animal in about thirty minutes. The lighter the anæsthesia, however, the shorter was the period before neutralization was accomplished. This result gave us our clue to the tendency to acidosis and to death under anæsthesia of weak and emaciated patients. The increased acidity produced by the anæsthesia was sufficient to overcome the already narrow margin of safety. That acid intoxication *follows* the adminstration of ether and chloroform has been noted by many observers—that acidity being evidenced by the early appearance in the urine of acetone and later diacetic acid. It has also been noted, as one writer states, that the "starvation preceding and following the operation is also a factor of considerable importance."

Our experiments have shown, however, that the increased

acidity actually develops *during the anæsthesia* itself, sometimes to a fatal degree, and that a starved condition is not only of "considerable" but of *prime* importance since it means that the acid-neutralizing power of the liver has been surely impaired, possibly lost.

Two more important clues were obtained from the result of the H-ion concentration tests after the administration of morphin and of alcohol. Alcohol caused acidity, the acidity not being so marked, however, as that produced by the anæsthetics. The H-ion concentration was not altered by morphin no matter what the size of the dose. When the adminstration of morphin preceded the induction of anæsthesia then a smaller amount of the anæsthetic was required to produce complete anæsthesia, and the H-ion concentration test showed that the acidity was markedly less than in anæsthetized animals which had not received the preliminary dose. The preliminary dose of morphin not only lessened the degree of acidity produced by the anæsthetic but it in no way interfered with the return of the blood to its normal alkalinity; on the contrary—and the following observation is of great significance—if the morphin was given *after* acidity had been produced by the anæsthetic, it postponed the time of neutralization and, if given in large doses, *prevented* the animal from overcoming the acidosis. That is, it would appear that morphin controls the mechanism which governs the neutralization or alkalinization of the blood.

In these facts we may find the explanation of the outcome we have described as the occasional sequence, in handicapped patients, of operations on the gall-bladder and stomach. If under normal conditions a definite amount of energy is stored in each of these vitals organs—the brain, the suprarenals, and the liver, then any reduction of this amount by the psychic or physical environment incident to an operation diminishes by so much the safety of the operation. This is true of any operation, but in the operations which we are considering, when one of these vital organs has itself been attacked by the pathological condition for which relief is sought, the integrity of that organ is still further endangered.

In this explanation we may find the clue to the solution of our second problem—the development of measures which will protect or perchance widen the patient's margin of safety.

Every further drain upon the energy remaining in the organs of the kinetic system must be minimized or prevented if possible. In suitable cases pre-operative emotion must be minimized by pre-operative medication. Nitrous-oxide-oxygen instead of ether should

be the anæsthetic, since this anæsthetic does not impair the immunity as does ether.

Nerve blocking with novocain should precede every division of nerve-bearing tissue; trauma should be minimized by employing sharp bloodless dissection and by the avoidance of pulling and tearing manipulations; postoperative pain should be minimized by quinine and urea hydrochloride injected at a distance from the line of incision but including the entire area of operation; the post-operative environment should be made cheerful and hopeful, narcotics being used when required to prevent pain and undue psychic strain.

In brief, then, the mortality and morbidity attending gastric and gall-bladder operations may be still further reduced by using methods which minimize trauma, pre-operative and postoperative emotion and pain, and by so doing conserve the energy remaining in the cells of the brain, the suprarenals, and the liver in patients in whom the stores of energy in their kinetic organs have already become depleted by the exhaustion due to the disease from which they seek relief.

To recapitulate: For the class of patients we have been considering, those handicapped by the exhaustion which is incident to pathological conditions of the liver and stomach, the ideal treatment comprises:

1. The pre-operative administration of sodium bicarbonate and glucose and of bromides *per rectum.* Morphin is contra-indicated if acidosis is present or threatened.

2. Ether twilight anæsthesia or a light nitrous-oxide-oxygen anæsthesia.

3. A technique so accurate and so completely anociated by the use of local anæsthetics and gentle manipulations that but a small amount of the anæsthetic is needed.

4. As rapid a technique as is consistent with good work, that the period of anæsthesia may be as short as possible.

The clinical record upon which these conclusions are based include the histories of 893 operations on the biliary tract and 331 on the stomach performed by my associates, Dr. Bunts and Dr. Lower, by the members of my surgical staff at Lakeside Hospital and by myself.

# "PELVIC INFLAMMATION"

By A. L. Lockhart, M.B. (Edin.)

*Montreal*

THE term "pelvic inflammation" covers such a broad field that the following remarks will be confined to those inflammatory processes affecting the Fallopian tubes, the ovaries, and the cellular and peritoneal tissues contained in the cavity of the pelvis.

This inflammation is caused by the invasion of organisms by (1) direct continuity through the vagina, uterus and tubes, (2) through the blood stream, (3) through the lymphatics, or (4) through the walls of the bowel. When the trouble has spread by direct continuity, the attacking organism is usually the gonococcus of Neisser, in which case the affection is most commonly bilateral. The other routes are followed—and these are named in the order of their frequency of occurrence—by the streptococcus, bacillus tuberculosis and bacillus coli, the latter being most often seen in a recrudescense of an old attack, where the bowel wall has been weakened, thus allowing of more ready escape of the microörganism.

*Diagnosis.* While one frequently has all of the tissues in the pelvis, viz., the tubes, ovaries, peritoneum and cellular tissue, synchronously involved, usually one structure or pair of structures is isolated for attack by the offending organism. It may be very easy, in the latter case, to make a differential diagnosis, but at times this is attended with the utmost difficulty.

One of the most perplexing cases is where you have inflammation on the right side of the pelvis and you must determine whether the appendix is at fault or the ovary or tube of that side. The history, if one can be obtained, will be of value in making a diagnosis. As an almost invariable rule, tubal disease is preceded by an attack of gonorrhœa, follows pregnancy, or else there is some focus of tubercular disease elsewhere in the body. Any vaginal discharge should be carefully examined for microörganisms, the finding of the gonococcus being strong evidence that you have to deal with a right-sided salpingitis. Gastric disturbance

Read in the section of obstetrics and gynæcology at the meeting of the Canadian Medical Association, St. John, N.B., July 8th, 1914.

is usually much more marked in inflammation of the appendix than where the tube or ovary is affected. On examination of the abdomen, if the disease is appendiceal the point of maximum tenderness will be over McBurney's point, while if it is tubal it is lower and nearer to the middle line. At times, also, you have a tender point on each side of the middle line just below a line joining the two anterior superior iliac spines in disease of the appendages. Vaginal palpation of the mass is more difficult in disease of the appendix than of the tube or ovary.

The differentiation between inflammation of the tube and where this structure is the seat of gestation is more important than the above, in that the treatment of the two conditions is so radically different. One usually, and quite correctly, associates a subnormal temperature and a rapid, weak, thready pulse with ectopic gestation, but it must be remembered that, soon after leakage from a pregnant tube or its rupture, absorption begins, and this is almost invariably indicated by the rapid, bounding pulse and elevation of temperature of inflammation. This was well illustrated in the case of a woman who was admitted to the gynæcological service of the Montreal General Hospital several years ago. She was brought to the front door late one night and no history could be obtained. Her temperature was 103·2°, and pulse 120 beats to the minute and bounding in character. Her mucous membranes were a good colour. On making a pelvic examination, a very profuse muco-purulent vaginal discharge of a greenish-yellow colour was seen, the cervix was felt to be soft and the fundus was incorporated in a mass the size of a three and a half months pregnant uterus. The abdomen was tender over the whole lower third. As peritonitis was evidently present and the condition of the patient did not admit of delay, abdominal section was performed and revealed a ruptured gestation sac with some organization of the blood which filled the peritoneal cavity. Usually, however, oozing of blood from the uterus, a history of amenorrhœa or of hæmorrhage beginning soon after a menstrual period, and a steadily enlarging sausage-shaped mass, lying to one side of the uterus, will permit of a diagnosis of ectopic gestation. If still in doubt, the performance of a posterior colpotomy will clear up the question at once. If seen immediately after rupture, the case will present little, if any, difficulty in diagnosis.

Abscess of the ovary is a comparatively rare disease and usually follows the termination of pregnancy, either full term or premature. In such a case, the patient will probably progress

very favourably for a week or ten days, when the temperature begins to rise, the pulse rate becomes increased and the patient experiences pain in one or other side. Examination will reveal enlargement of the ovary together with exquisite tenderness in that region. The ovary will steadily increase in size until it may be readily palpated through the anterior abdominal wall. This is a good example of the infecting organism travelling by means of the blood stream or lymphatic channels, as there is frequently no infection of the uterus, the germs gaining entrance to the system through a tear in the perineal body, and thence spreading up and outwards through the broad ligament to the ovary. Only very recently I operated upon the wife of a physician. She had suffered a complete laceration of the perineum at childbirth, repair of which was attempted but failed. Septic pelvic peritonitis resulted, and finally settled in a mass on the left side. This was treated by hot air with marked benefit but it would not resolve. On opening up the abdomen, this mass was found to be the left ovary which was the size of a billiard ball and which was embedded in a mass of adhesions. The tube ran over this and was simply somewhat hard and thickened. The organisms had here entered through the lacerated perineum and traversed the broad ligament to the ovary. When the cellular tissue of the pelvis is affected, it is usually as the result of infection during the emptying of the pregnant uterus. It may follow either a full term delivery or an abortion, especially when the latter has been brought about by artificial means. The onset is usually heralded by a chill, which is followed by elevation of temperature, increase in the rate of the pulse, which is full and bounding, pain and localized tenderness. The latter, at first, is spreading but later on becomes localized over the diseased area as a rule. On making a pelvic examination, a mass is to be felt within the cavity. This mass is hard, is confined to the base of the broad ligament or the side of the pelvis and its lower border is ill defined, the mass gradually fading away towards its lower and lateral aspects. The sensation which it imparts to the examining finger has been aptly compared to that which would be produced if plaster of Paris were poured into the pelvis. The upper surface, however, is well defined and rounded, being composed of inflammatory exudate, coils of intestine and the omentum, which usually tries to cover over, and thus limit, any inflammatory focus within the abdomen or pelvis.

While pelvic peritonitis is usually caused by the spread of the inflammation from one of the above-mentioned conditions, what

may be fitly described as an "irritative peritonitis" undoubtedly exists. This form is seen to result from the escape of fluid into the peritoneal cavity where the uterus is perforated by a douching curette. It also may occur even in virgins where they expose themselves to cold, as by taking a cold bath or getting their feet wet during the menstrual period. Here one sometimes sees a reflux of blood from the uterus along the tube and so into the peritoneal cavity where it acts as a foreign body and thus sets up inflammation.

Finally, one may have a troublesome pelvic inflammatory mass arising from infection of blood clot left in the abdomen after an urgent operation for a ruptured ectopic sac.

The *prognosis* depends largely upon the nature of the attacking organism. When this is the gonococcus, the prognosis is good but it is much more grave when streptococci are present.

The mass may resolve completely, leaving the patient with a comparatively healthy pelvis. Pus, even, may be entirely absorbed but this happy termination is not very common. The sac may remain *in statu quo* ready to have the inflammation relighted on the slightest provocation. It may rupture into one or other of the adjacent cavities, such as the peritoneal cavity, the bladder, rectum, vagina or uterus, or else externally through the skin. In the case of one patient, recommended to me by the late Professor J. C. Cameron, cellulitis followed the delivery of a full-term child. When first seen, the mass was low in the base of the broad ligament and well to the side of the uterus. It gradually worked up between the layers of the broad ligament, under the fascia of the pelvis, until it lay entirely in front of the peritoneum of the anterior abdominal wall, incision through which permitted the escape of about 750 cc. of pus, drainage of the succeeding cavity being followed by cure.

The *treatment* of pelvic inflammation is the most important question to be considered. Fortunately, cases of pelvic inflammation, seen by the gynæcologist, rarely call for immediate operative interference, usually permitting one to wait until the acute process has subsided.

The routine treatment of patients admitted to the gynæcological wards of the Montreal General Hospital suffering from acute pelvic peritonitis consists, first, in making a thorough bacteriological examination of any vaginal discharge which may be present. The patient is kept at absolute rest in bed, often in the Fowler's position. Ice is placed over the whole of the lower abdomen and

kept there. If the fornices of the vagina are not too tender, copious hot antiseptic vaginal douches are given twice daily, using but little force. The bowels are kept empty by using enemata whenever indicated. Occasionally the ice requires to be replaced by hot applications, but this is rarely necessary, the cold usually having the desired result of the relief of pain and congestion. If neither relieves the pain, morphine may be administered hypodermically, but this is only necessary for the first few hours during the time required for the ice or heat to take effect. When the patient is simply restless and not in much pain, a hypodermic of pantopon, given at night, is preferable to morphine, as it has a less deleterious effect upon the gastro-intestinal tract. The diet, of course, is to be of the lightest but most nourishing description, and it is frequently necessary to stimulate the patient by the judicious use of strychnine, either hypodermically or *per os*. The woman ought to be most carefully watched, and, if no improvement takes place in a few days, or she is perceptibly growing worse, operative measures must be considered. Where the mass is definitely pointing in one or other vaginal fornix, puncture per vaginam will be found of service. This, however, is not good surgery, if it can be prevented, as the sac always remains and will frequently give trouble later on, but it enables one now and then to tide a patient over the crisis and to build up her strength for more radical treatment later on. It is much better to open the abdomen and boldly attack the mass from above, removing the sac intact whenever possible. When this is attempted, it is well to make a good free incision so as to get well above the affected organ, in which case you can push the intestines up into the abdominal cavity, where they are retained by large abdominal towels, which also prevent any pus which may escape from contaminating the intestines. If possible, withdraw the pus from the sac by means of an aspirator before commencing its enucleation, thus rendering the operation a comparatively clean one. If any pus has escaped into the resulting space it should be wiped up gently with gauzes wrung out of 1 to 500 formalin solution, a portion of which may be left in the pelvis for a few minutes without the slightest fear of any harmful results. Unless the process is so acute as to indicate a very virulent organism or the peritoneal cavity has been considerably contaminated by pus, one may close the abdomen without drainage. If this is done and the patient placed in the Fowler position, the pelvic peritoneum can take care of a considerable number of microörganisms. If, however, the peritoneum has been soiled by virulent septic pus, puncture the posterior vaginal fornix and drain through

the vaginal and abdominal incisions, using a rubber tube for the former and a cigarette drain for the latter. When the condition has settled down into a chronic state much may be done, short of operation to give the patient relief. The pelvic structures may all be matted together and yet may be restored to a healthy condition by appropriate local treatment. One of the worst cases of chronic pelvic peritonitis that I ever saw was in a woman who had been sterile for fifteen years after having given birth to two full-term children. Rest in bed, vaginal tampons, hot douches, applications of tincture of iodine to the vaginal fornices, together with the use of the galvanic current, so cleared up the pelvis that she became pregnant and gave birth to a fine boy. The course of treatment was a long one but the result was worth the trouble. In using hot douches for such a condition as this, many simply use one or two quarts of water. This is not giving this form of treatment a fair showing, as at least one gallon ought to be used twice daily, having the water decidedly warm. It is the warm moisture which causes the absorption which is aimed at, and not the antiseptic. During this treatment it is of course essential that the patient abstain from all sexual relations, as all causes of pelvic congestion cannot be too carefully avoided.

One of the most useful therapeutical agents in gynæcology is dry heat, which was first brought to my notice in a paper written in 1909 by Dr. George Gellhorn of St. Louis. Polano first suggested its use in gynæcology, and several methods of applying it have been devised but that introduced by Gellhorn is the best. His apparatus "consists of two semicircular cradles made of thin sheetiron and covered on the inside with asbestos. These two cradles lie one upon the other and may be pulled apart in the fashion of a telescope. On the inside of the free edges, eight electric light bulbs are attached and a long wire furnishes the connection with the nearest switch. A hole in the roof of the cradle is provided for the thermometer. The mercury bulb of the latter should be only three or four inches above the abdomen, so as to register the actual temperature of the air near the body, that in the upper portion naturally being warmer than that in the lower portion. If no thermometer is used, this hole may serve as a chimney through which the hot moist air can escape. There are also a number of hooks from which gauze bags filled with calcium chloride may be suspended in order to absorb any moisture within the air chamber." This apparatus is clean, light, perfectly safe and easily regulated, and can be used to apply heat to almost the whole body by simply drawing one cradle beneath the other.

Out of twenty-two cases of pelvic inflammatory trouble treated by me by non-operative measures since January 1st, 1913, the application of hot air to the abdomen has been the treatment carried out in fifteen, the cases being diagnosed as follows: chronic pelvic peritonitis, six cases; salpingo-oöphoritis, chronic, nine cases, acute, three cases; chronic pelvic cellulitis, four cases. The number of bakings varied from sixteen to seventy-four, the average being just under forty. The majority of women were baked twice daily for twenty minutes at a time. In very many cases, vaginal douching and tamponing and the application of tincture of iodine to the vaginal fornices were also practised. Two of the acute cases were treated by this method, but the acute condition was subdued first by the application of ice to the lower abdomen, rest in bed, etc., after which the hot air was applied. Only in two instances was the heat commenced while the temperature was above normal, and in neither case was any bad result noticed. In fact, one was showing no improvement after some weeks ordinary treatment, but as soon as the baking was commenced, the mass which had been present seemed to almost melt away. As for results, one patient was improving but left the wards against advice; three are noted as "improved," while eleven are put down as "well."

Most of the cases did not present any symptoms or conditions worthy of note, but the following may possibly be of some interest in the way of provoking some discussion. Before relating them, however, I wish to thank my house-surgeon, Dr. A. B. Walter, for his assistance in treating many of the above patients and in procuring information for this paper.

Case 1. Mrs. C., aged twenty-eight, was admitted to the Montreal General Hospital on January 17th, 1913. The history obtained was that she had been confined of a full-term child thirteen days previously. She had been running a temperature ever since the second day. On admission her temperature was 106°, pulse 120, and respirations 24. She had a severe chill just after entering hospital and was in a very bad septic condition. Her attending physician had given her several intra-uterine douches because the lochia were very foul. The abdomen was greatly distended by gas in the bowel, and in the right lower quadrant one could feel a rounded, tender mass the size of a large grape fruit. The skin was dry and harsh and the tongue foul and coated. A blood culture was taken but yielded negative results. An injection of 30 cc. of antistreptococcic serum was given in the evening, and by the next night the temperature was 98°, pulse 98, and respirations 24. At the same time 5 grains of collargolum were given *per*

*rectum* and repeated every twelve hours for three doses. The temperature remained down for about three days and the patient steadily improved, but at the expiration of that time the temperature and pulse-rate again rose, though only to a moderate degree. In addition to the above, she was given an antiseptic vaginal douche twice daily, ice was applied to the abdomen and strychnine was administered hypodermically. The patient steadily improved but there was practically no diminution in the size of the mass, so that on February 20th the ice was discontinued and she was given the hot air bath for twenty minutes each day, with the result that the mass subsided so rapidly that on March 7th, i.e., fifteen days after the first air bath, she was discharged cured. At this time a pelvic examination was made, the uterus was felt to be pulled towards the right side, and a small mass was felt to the right of, and posterior to, the uterus, this subsequently clearing up. At the time of writing, the patient is two months pregnant.

Case 2. Mrs. R., aged twenty-four, was admitted to the Montreal General Hospital on April 13th, 1914. She had been delivered at term in the country on April 5th, the labour being precipitate. The perineum was lacerated into the rectum and was stitched up at once. On the fourth day *post partum*, she felt chilly and the temperature ran up to 104° with correspondingly rapid pulse. Under appropriate treatment she improved, but here again a mass developed but on the left side. Ice and douching having failed to reduce this, hot air baths were commenced on May 6th, and given once daily until she was discharged on May 28th, the vaginal douching being kept up. At this date, the mass had markedly decreased in size until it was as large as a billiard ball, hard and not sensitive. Although the abdomen had to be opened and the mass removed later on, the hot air had a most beneficial effect in reducing the size of the mass, and was undoubtedly of great benefit. When removed, the mass was found to be an abscess of the left ovary and contained numerous streptococci of a very virulent type. This case was a good example of the imperviousness of an abscess wall to microörganisms, as during the five weeks which elapsed between her discharge from hospital and operation her temperature remained between 98° and 99°, except upon one or two occasions when she sat up in a chair.

This paper has been written principally to bring before you the beneficial effects of the application of hot air in cases of pelvic inflammation, and I hope that you will give the treatment a fair trial, as I am convinced that it will save many a woman from a dangerous and mutilating operation.

# SOME ELEMENTARY FEATURES OF THE *X*-RAY DIAGNOSIS OF GASTRIC CARCINOMA, GASTRIC ULCER AND DUODENAL ULCER

By R. D. Carman, M.D.

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THE attitude of the profession toward the radiologic diagnosis of digestive tract lesions is a discordant composite of unwarranted faith and unwarranted skepticism. On the one hand are those who have a sublime but excessive confidence akin to that of the patient who believes that the radiologist can look directly into his innermost recesses and see all his lesions. On the other hand are the skeptics who abide with us always. Some of these are congenitally and hopelessly skeptical. Others have acquired their doubt from disappointing experience. Often they have expected too much from the Roentgen ray; sometimes their clinical opinion was not confirmed; sometimes they assumed that the *x*-ray should make a refined diagnosis without any other aid; sometimes the radiologist himself was not blameless. Extraordinary and unreasonable expectations on the part of the clinician, or the fear that the surgeon might find an undiscovered lesion, may have stimulated the radiologist to such excessive zeal that his imagination overcame his judgement, and a mistaken diagnosis resulted. The endeavour to satisfy inconsiderate demands from the physician or his patient is, to my mind, responsible for a vast amount of dissatisfaction with radiologic work.

The radiologic manifestations of gastro-intestinal pathology have various and fluctuating values. Some of them singly have almost pathognomonic importance. Others, taken alone, are much less conclusive yet are often strongly indicative in combination. Still others are merely suggestive, but worthy of inclusion in a general correlation.

In this work we encounter three varieties of stomach: the normal, the reflex and the pathologic, and the signs of these must be learned and distinguished from one another. Distinction of the pathologic from the normal is not very difficult, but distinction

Read before the Alberta Medical Association, Medicine Hat, July 16th, 1914.

of the pathologic from the reflex is often troublesome. These reflex manifestations, which are commonly of a spasmodic character, occur frequently in association with disease of the gall-bladder or appendix, and occasionally in neurasthenia, tabes, intoxications, renal calculus and other conditions. They produce the most numerous and most deceptive counterfeits of pathologic signs, and their careful exclusion is always essential.

The *x*-ray examination of the digestive tract is not a mysterious art requiring unusual talents; but neither is it a simple procedure which can be learned in a day. It requires no more but no less patient effort, common sense, and industry than any other diagnostic method, and experience with sufficient material is indispensable for satisfactory work. Examinations must be thorough, findings must be recorded systematically for study, and cases must be followed to the operating room and the post-mortem table. I would strongly urge the radiologist to recapitulate and digest his records from time to time, in order that he may better learn the relative worth of his observations, and thus increase his diagnostic acumen. Under these conditions the radiologic examination of the digestive tract is of sufficient value to justify its routine employment. Its worth is shown by the fact that in our own considerable series of cases, definite signs were found in 93 per cent. of the gastric carcinomas, 83 per cent. of the gastric ulcers, and 50 per cent. to 60 per cent. of the duodenal ulcers.

Our technique, which has been altered slightly from time to time, is in essence a combined fluoroscopic and skiagraphic examination with a double opaque meal. The patient, having been purged with castor oil the evening previous, is given for his breakfast an ordinary portion of cereal containing two ounces of barium sulphate. Six hours later, having fasted meantime, he is examined with the screen, during which he is given two ounces of barium sulphate in eight ounces of water, followed by two ounces more in a pint of potato-starch pap, after which plates are made. By the test breakfast the motility of the stomach is determined, and a distinct residue after six hours is significant of impaired clearance, nearly always from organic cause. The purpose of the barium water is to fill any minute recesses and to visualize the pyloric canal and duodenum, while the pap, by holding the barium in suspension, outlines the entire stomach for screening and plating.

There are so many variations of the normal stomach that they may be learned only by experience. Each stomach fits the form of its possessor, and as persons vary greatly in their build,

their stomachs show corresponding differences. However, a normal stomach may be defined roughly as of either steer-horn or fish-hook form, usually the latter, capable of emptying itself within six hours, its contour unbroken save by peristaltic waves and certain normal incisuræ, its tone sufficient to maintain a more or less tubular form, and its walls flexible and mobile to palpation. Its position is quite variable within normal limits.

The abnormal stomach manifests itself by alterations of form, contour, motility, peristalsis, mobility, flexibility, tone, and position.

Gastric Carcinoma. The principal radiologic sign of cancer of the stomach is the filling defect, an irregularity of contour produced by the thrust of the tumour mass into the gastric lumen. Filling defects vary in size according to the extent of involvement, and they also vary somewhat in appearance according to the character of the cancer, the medullary type generally producing gross, mulitple, shaded, localized irregularities, while the scirrhous cancer often shows rather smooth but extensive narrowing of the gastric calibre. Though cancers may be seated in any part of the stomach, the majority are found in the pyloric portion. In these cases the pyloric end may be apparently obliterated by the growth, or the lumen may be reduced to a narrow spicule. An extensive filling defect in the mid-portion of the stomach may produce an hour-glass form, the canal joining the two segments being usually central, long and slightly irregular.

Filling defects must be differentiated from indentations caused by a gas-filled colon, adjacent extrinsic tumours, and by spasm. These conditions can often be determined by palpatory manipulation. Where spasm is suspected to be the cause of deformity, it may usually be relaxed by the administration of belladonna or atropine.

Alteration of the pyloric function in carcinoma may show itself in either of two quite opposite ways. The pylorus by reason of stiffening and infiltration or because of lessened acidity of the gastric contents often remains gaping, permitting a free and continuous flow of the opaque ingesta through it. In other cases pyloric obstruction, varying in degree with the size and situation of the tumour, is evidenced by a distinct residue from the six-hour meal. High-seated obstruction may result in dilatation of the esophagus from backing up of the ingesta.

In non-obstructive cases, hypermotility is commonly observed, the "head" of the six-hour meal being found in the transverse

colon or farther, whereas under normal conditions it is usually seen at or near the cæcum.

The peristaltic activity of the carcinomatous stomach is markedly diminished, as a rule, although exaggerated peristalsis has been noted exceptionally in obstructive cases. In these cases, also, antiperistalsis has occasionally been observed. Interruption of peristaltic waves by carcinomatous infiltration is an important sign; the wave progresses to the affected area, skips over it, then takes up its course beyond.

Lessened mobility, as a result of the growth anchoring the stomach to adjacent structures, is an occasional finding. More important is the lessened flexibility of the infiltrated gastric wall, the palpating finger making little or no impression upon the gastric outline.

Syphilis of the stomach, though relatively rare, gives radiologic signs which are practically impossible to distinguish from those of carcinoma. Benign tumours are also occasionally but infrequently met with, and when found are usually in the pars pylorica. They produce filling defects similar to those of carcinoma.

Gastric Ulcer. The cardinal and practically pathognomonic signs of ulcer are the niche and the accessory pocket, showing as additions to the gastric contour, and representing the excavation produced by the ulcer. The niche is a bud-like, often minute, projection from the bismuth-filled lumen, lies wholly within the gastric wall, and is an index either of penetrating ulcer, or of a perforating ulcer which has not excavated an adjacent organ. The accessory pocket, sometimes loosely spoken of as a "diverticulum," is a pouch-like excavation resulting from extension of a perforated ulcer into near-by tissues, usually the liver or pancreas. Accessory pockets range in size from that of a filbert to that of a walnut, and may show as a miniature stomach with successive layers of gas, fluid and barium, and may retain barium after the stomach is empty. An accessory pocket in the liver moves with respiration, while a pocket in the pancreas does not. The latter also has a more posterior situation as shown by oblique view, and a wider excursion on rotating the patient.

Both the niche and the pocket are obviously signs of advanced ulcer, but ulcers are frequently found at operation which are not sufficiently extensive to produce an excavation that can be visualized on the screen or plate. Often these are mere mucous erosions or small slit-like crevices and their diagnosis can only be predicated upon less definite signs which are common to them and to the more

advanced type. These signs, which have various degrees of value, both singly and in combination, include: (1) the incisura; (2) hour-glass stomach; (3) residue in the stomach after six hours; (4) pressure-tender point; (5) acute fish-hook form of the stomach with displacement to the left and downward; (6) lessened mobility; (7) hypotonus.

The *incisura* is a non-moving indentation of the greater curvature, opposite an ulcer, usually deep and narrow, but not always so. It is believed to be produced, at least in some cases, by the irritation of an ulcer or its scar causing a spasm of the circular muscle-fibres in that plane. Perhaps in some cases there is infiltration and stiffening of these fibres. A true incisura must be distinguished from the incisura cardiaca, a slight, shallow depression at the juncture of the cardia and media, from the wide but shallow incurvation often seen beneath the left costal arch, from peristaltic waves and from false incisuræ due to reflex spasm. A peristaltic wave, which progresses pyloruswards, would only be confounded with an incisura on the plate, and in the absence of a niche. False incisuræ sometimes travel and are sometimes stationary. Often they can be effaced by massage and they usually disappear after the administration of an antispasmodic. Hence the belladonna test should always be applied to suspected incisuræ. This test, however, is not absolutely conclusive for I have seen an incisura produced by a mesenteric adhesion-band which persisted in spite of the test.

Organic hour-glass stomach may occur, with or without the accessory pocket of perforated ulcer. It is imitated by reflex spasmodic hour-glass, which can usually be relaxed by belladonna.

A definite residue in the stomach from the six-hour meal is quite often noted in gastric ulcer regardless of its situation, but it is also found in many other conditions, notably carcinoma, duodenal ulcer, and disease of the gall-bladder and appendix.

A pressure-tender spot, definitely localized to the lesser curvature opposite an incisura is of considerable value. This combination of a tender point with an incisura is fair proof, even though no niche be present.

An acute fish-hook stomach, displaced to the left and downward, is occasionally seen in ulcer, but, in default of other signs, is of no value.

Lessened mobility is a sequence of perforated ulcer with adhesions, but is of little independent worth.

Hypotonous is often seen, but not invariably.

The worth of all these minor signs and their combinations depends upon the experience of the observer and their association with the clinical data.

Carcinomatous ulcers have practically the same signs as benign ulcers, and usually only the pathologist can determine the presence of malignancy. However, the radiologist should suspect malignancy when the ulcer crater is unusually large.

DUODENAL ULCER. While the radiologic indications of duodenal ulcer are numerous, their values are by no means equal. Some of them are rather peculiar to ulcer of the duodenum, others are only indefinitely suggestive. Accordingly, they may be divided into major and minor signs. The major signs are: (1) gastric hyperperistalsis, with or without a six-hour residue; (2) an accessory pocket of perforating ulcer.

Minor signs include: (1) gastric hypermotility with early free opening of the pylorus and rapid clearance of the stomach; (2) gastric hypertonus; (3) irregularities in the outline of the bulb or of the duodenum; (4) lagging of bismuth in the duodenum; (5) pressure-tender point over the duodenum; (6) reflex gastrospasm producing hour-glass contraction or transient incisura.

Gastric hyperperistalsis deserves especial emphasis as a practical and valuable sign of duodenal ulcer. When found in conjunction with a six-hour gastric residue it is almost certainly diagnostic. C. H. Mayo[1] remarks that a similar hyperperistalsis also occurs in the urinary bladder in cases of urethral obstruction. However, even in default of any duodenal obstruction, at least sufficient to result in a six-hour gastric residue, hyperperistalsis occurs in more than half the cases of duodenal ulcer, a frequency far greater than that noted in any other condition.

A six-hour gastric residue was found in over a third of our cases, as a consequence of duodenal obstruction from ulcer-scar contraction, but, unless accompanied by hyperperistalsis, this finding is no more significant of duodenal ulcer than of any other obstructive lesion. The combination of six-hour residue and hyperperistalsis occurred in 25 per cent. of our series.

Normal peristalsis, as observed with the technique previously described, commonly manifests itself in one or, exceptionally, in two pairs of waves of moderate depth traversing the pyloric portion of the stomach. The hyperperistalsis of duodenal ulcer is characterized by an increase of wave depth and number. Three or more pairs may be seen at once, and their field of activity covers the pars media as well as the pars pylorica. Both curvatures are

equally indented and this symmetry of the contractions is a notable characteristic. As a rule the waves are orderly, succeeding each other at regular intervals, though occasionally in cases complicated by perforation or by invasion of the pyloric ring, some irregularity of succession or depth may be seen.

In the obstructive cases the waves may be so deep as to nearly segment the stomach whose configuration resembles a row of balls. But the hyperperistalsis is not merely compensatory to obstruction by duodenal stenosis, for we find exaggerated peristaltic vigor in the non-obstructive cases also, though of somewhat lesser degree.

In looking for hyperperistalsis as a sign of duodenal ulcer, certain facts must be kept in mind:

1. Immediately after drinking the barium-water mixture many patients show considerable peristaltic activity in the pyloric portion of the stomach, whether a lesion be present or not. This peristalsis usually soon ceases. The hyperperistalsis of duodenal ulcer is seen after filling the stomach with the barium pap.

2. After giving the pap the institution of peristalsis is often delayed for several minutes. Hence sufficient time should be given in suspected cases to permit this sign to appear.

3. By holding the abdomen rigid, or through fright or disgust for the meal, the patient may inhibit peristaltic action for a time. Therefore, he should be urged to relax his abdomen, and his fears should be quieted.

4. Hyperperistalsis may be more or less intermittent, periods of activity alternating with periods of quiet.

5. Hyperperistalsis may occur as a reflex from conditions other than duodenal ulcer, especially from disease of the gall-bladder and appendix, though far less frequently. In a recent recapitulation we found that hyperperistalsis was noted in 57 per cent. of the ulcer cases, 6 per cent. of the gall-bladder cases, and 3 per cent. of various other lesions. To differentiate from these latter conditions it is desirable to know the salient points of the clinical history, which in ulcer is strongly suggestive. We, therefore, routinely record the principal facts of the anamnesis prior to examination, and this serves the additional purpose of directing particular attention to the possibilities thereby suggested.

6. Hyperperistalsis with obstructive carcinoma or ulcer of the pylorus is seen far less commonly than might be supposed and when found is usually different from that of duodenal ulcer. The waves affect the greater curvature chiefly or exclusively, and, as a

rule, are disorderly in their depth and sequence. In these cases also, antiperistalsis is occasionally noted.

Wilkie[2] during the past three years, in the examination of four hundred and ninety cadavers, found forty-one cases of duodenal ulcer. In only six cases had the diagnosis been made *ante mortem*, and all of these had been operated on. He directs attention to what he calls "silent" ulcers, namely, chronic ulcers which during life had produced no typical symptoms, and which might result in perforation or death from hæmorrhage. These "silent" ulcers occur mostly in persons with arteriosclerosis and are usually found on the posterior wall. His statements are of particular interest as having a possible relation to a suggestion which I have previously advanced, namely that the absence of hyperperistalsis in some cases of duodenal ulcer may perhaps be due to the location of the ulcer.

The accessory pocket of perforating duodenal ulcer, which is similar to the pocket of perforating gastric ulcer, is quite decisive when found, but this is rare, occurring probably in not more than 1 per cent. of the cases.

Radiologists who make frequent examinations at intervals after the opaque meal has been taken have frequently called attention to hypermotility as an accompaniment of duodenal ulcer, the stomach often emptying, it is claimed, within two hours. With our routine technique it can be established that there is often a free flow through the pylorus at the time of examination and that the stomach in cases of non-obstructive duodenal ulcer is empty after six hours. Occasionally, the "head" of the six-hour meal will be found in the transverse colon or beyond, indicative possibly of hypermotility, but in a large series of cases the "head" of the meal will commonly be found in the cæcum—its usual position under normal conditions.

Hyperperistalsis should not be confounded with hypermotility. Other things being equal, hyperperistalsis would tend to result in hypermotility, but the most typical hypermotility is seen in cases of carcinoma and achylia where the peristaltic activity is subnormal.

Gastric hypertonus is a common but not invariable accompaniment of duodenal ulcer, yet it may exist quite independently of the latter. Hypotonus is observed occasionally as a result of obstruction and loss of compensation; but the maintenance of gastric compensation in the face of rather marked duodenal obstruction and for long periods, is a noteworthy phenomenon, contrasting

strongly with the early dilatation consequent upon pyloric obstruction.

Deformity of the duodenal outline, especially of the bulb, has been industriously lauded as a pathognomonic sign of duodenal ulcer by radiologists who depend mainly upon plate findings for diagnosis, but I am quite unable to share their enthusiasm. I have encountered many cases in which such deformity was due solely to spasm, or to adhesions from a cholecystitis, or simply from a lack of sufficient opaque media to fill the bulb. In a recent paper,[3] I stated that "the degree of distension of the bulb and consequently the effectiveness of visualization will depend in part on the ratio between the amount of bismuth flowing through the pylorus and the rate of duodenal evacuation." Unlike the stomach, the duodenum has no distal sphincter to block immediate evacuation. The opaque meal coming through the pylorus into the duodenum is carried away without tensing the duodenal walls, at least to any considerable degree, except only in those cases with decided obstruction, and in these instances the bismuth is held proximal to the lesion. If by some simple and practical method the duodenum could be blocked beyond the ulcerous area, the latter might possibly be shown.

Pathologically, there is no difference between duodenal and gastric ulcers, except that the former are smaller, contain less scar tissue, are less likely to produce adhesions and practically never result in carcinoma. They may perforate or produce hæmorrhage just as do gastric ulcers. They have craters which, theoretically, should fill with the opaque meal and show as bud-like projections as do ulcers of the stomach, but I have never observed a niche in the duodenum, and I am not likely to, for there is no mechanism to retain the bismuth long enough in the duodenum to make the presence of a niche certain, and for this reason, even if seen transiently, it could not be differentiated from deformity due to spasm, irregular filling, etc. Further, any such niche would of necessity be smaller and much more shallow than the niche of gastric ulcer because the duodenal wall is much thinner than that of the stomach.

In this connexion it may be noted that Schlesinger[4] takes a similar stand. He remarks that if we were to depend upon the demonstration of anatomic changes in the duodenum for the diagnosis of ulcer, the *x*-ray examination "would be one of the most thankless tasks," and that functional changes in the stomach, especially hyperperistalsis, furnish us the weightiest indications of duodenal ulcer. Lagging of barium in the duodenum, whether in

irregular patches or not, advanced some years ago as an index, is not peculiar to duodenal ulcer. A pressure-tender point over the duodenum may be noted with ulcer, but this can hardly be distinguished from a pressure-tender gall-bladder. Reflex gastrospasm with hour-glass contraction or transient incisura simply signifies an extrinsic irritation which may or may not originate in a duodenal ulcer.

References:

1. MAYO, C. H., Personal communication.
2. WILKIE, *Lancet*, May 23rd, 1914, p. 1465.
3. CARMAN, *Jour. Am. Med. Assn.*, March 28th, 1914, p. 980.
4. SCHLESINGER, *Deutsche Med. Woch.*, June 4th, 1914, p. 1155.

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A POST-GRADUATE school of neurology hes been organized by the neurological staff of the Philadelphia General Hospital. Instruction will be arranged in four periods of six weeks each, one, two, three or four of which can be taken by the students. The first course of six weeks commenced on Monday, December 7th, 1914, and will continue until the end of January. The second and third courses will be in February, March, April and May. Special short courses of two or three weeks each can be arranged for the mcnths of June, July, August and September. The instruction will be given by the members of the neurological staff of the Philadelphia General Hospital and their assistants, and such well-known names as Dr. Charles K. Mills, Dr. Charles W. Burr, Dr. William G. Spiller, and others, are among those mentioned. The fees for each period covering all branches taught will be twenty-five dollars. Further information may be obtained from Dr. C. K. Mills, 1909 Chestnut Street, Philadelphia.

# CONGENITAL DISLOCATION OF THE HIP

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THE tremendous development of surgery is nowhere better shown than in the advances made during the past two decades in the treatment of congenital dislocation of the hip. It is within the memory of most of the members present, that a patient afflicted with this defect was looked upon as a unique case, and caused only a flutter of excitement at the time of examination, and then was passed on as incurable.

Most of us recall the successful replacement after years of effort in the famous case of Dr. Buckminster Brown, of Boston. The uncertainty as to method attached to this case and the long and tiresome treamentt which it entailed, necessitated great courage on the part of both surgeon and patient even to think of attempting a cure.

Following this, Paci brought before the surgical world his successful treatment of this condition—which has been too often overlooked. Working almost simultaneously, Hoffa, then of Wurtzburg, and Lorenz, of Vienna, made an effort at the correction of this deformity by operative means, working largely on the assumption that the chief defect lay in a diminutive or defective acetabulum. The results of treatment by these surgeons, as a matter of medical history, are not very satisfactory. A great number of the cases became infected, a number of them with fatal results. This, however, gave the needed opportunity for the careful pathological study of the condition, and demonstrated that in the great majority of cases the acetabulum, while defective, was sufficiently formed to accommodate the head of the femur. It also gave the needed opportunity for the study of the general pathology of the condition, and as a result Lorenz developed his so-called "non-blutige" operation. This was simply the manipulation of the head into the more or less rudimentary acetabulum, fixing the thigh in the abducted position so that the head would not be dis-

Read at the annual meeting of the Canadian Medical Association, St. John, N.B., July 8th, 1914.

lodged, at the same time permitting a certain amount of weight-bearing—this latter being an essential factor in deepening the socket for the accommodation of the head of the femur.

ETIOLOGY. The etiology of the condition has been more or less a matter of conjecture, but of recent years it seems to be taking more definite form. It is now generally conceded that the head of the femur is displaced entirely by mechanical means. Le Damany, in a very interesting article on the subject, has pointed out that this type of deformity occurs only in the human fetus, and accounts for this by the doubled-up position necessarily assumed by the human fetus with the long thigh bones. The extreme flexion of the thighs *in utero* permits of pressure upon the lower ends of the femora, and this constant pressure, with the thighs in an adducted position, tends to make pressure upon the posterior portion of the acetabulum. This causes the socket to become more or less ovoid instead of the normal, rounded shape, the so-called creeping of the acetabulum. Specimens have been produced which show this defect rather characteristically. Along with this elongation of the socket, a certain degree of torsion or twist in the neck of the femur takes place, thus permitting the neck of the femur to ride upon the anterior margin of the acetabulum, producing the leverage which tends to throw the head completely out of the socket.

The rather interesting statistical statement is made also by Le Damany; that the luxation of the hips, in the northern part of France, is ten times more frequent than club-foot, and thirteen times more frequent than hare-lip: that the condition appears in more than one male in a thousand and in more than one female in two hundred of the population.

PATHOLOGY. As a result of post-mortem examinations and occasional dissecting-room specimens, with the assistance of the *x*-ray, the pathology of the condition has been fairly well defined. First, the bony changes show a shallow, irregularly triangular acetabulum with the base upward. This, as a rule, is not deep, and the over-hanging shelf of bone found in the normal acetabulum is practically never present. The depth of the cavity is usually filled with fatty tissue and some fibrous tissue. The head of the femur is more or less flattened and irregular in outline, and shows the ossification of the head undeveloped as compared with the normal. There is usually a distinct shortening of the neck with some torsion, the head being twisted anteriorily.

The ligaments show very definite and characteristic changes.

The capsular ligament, strengthened by the anterior pubo-femoral, is very extensively thickened in its upper part, and very much elongated. This portion of the capsule often attains a thickness of three eighths of an inch. The capsular ligament in its course from the margin of the acetabulum to the neck of the femur, especially in the older children, produces a marked constriction about its centre, forming a more or less hour-glass contraction. There is a fairly large cavity in the region of the head, and another in the region of the acetabulum, with this constricted area between. This is of very great importance in the consideration of the treatment of the condition. The ligamentum teres is very much attenuated, and often disappears entirely. It plays no part in the treatment of the condition, neither is it of any support at any stage. If the ligament should happen to be even moderately developed, it may coil up in the cavity in front of the reduced head and act as a sort of coil spring to prevent the head staying in its proper position. This, however, in the experience of the writer, is not of very serious or frequent occurrence.

Another factor which must be considered under the heading of pathology is the marked change which takes place in the muscles running from the pelvis to the femur. The most marked change is the shortening which takes place in the adductors. This, of course, is simply a matter of accommodation. The head of the femur being displaced backward and above its normal position, the muscles running from the pelvis to the femur naturally are shortened to this extent. The glutei are either unchanged or definitely lengthened by the greater distance which these muscles have to cover in their course from the dorsum of the ilium to their insertion in the great trochanter. The smaller rotators of the thigh are not markedly changed and play no part in the therapy of the condition.

Symptoms. The symptoms produced by such a pathological condition seem fairly obvious. As a rule, the defect is not recognized until the child begins to walk, and even then the waddle is sometimes overlooked because of the natural tendency of babes to an unstable type of gait in their early efforts at navigation.

In the unilateral cases, the difference in the apparent length of the femur on either side when the child is lying on its back, with the thighs fixed at right angles, should be easily noted, and probably would constitute the first symptom in the condition. When the child begins to walk, it is noted that there is a very distinct one-sided droop. The gait suggests at once the unstable character of the hip, because as soon as the body weight is put upon that side,

the ligaments stretch and allow a certain amount of sinking of the trunk. This gives an absolutely characteristic waddle. If the condition is bilateral, it will, of course, be a double waddle. The gait is so unlike anything else, except coxa vara, that it ought to suggest the condition at once. Aside from the gait, there is marked lordosis, the pelvis being tilted forward, because the centre of gravity of the pelvis is changed by the backward and upward displacement of the femur.

In double congenital dislocation, the lordosis will, of course, be more marked, and the trochanters show very prominently in the region of the buttock, thus apparently exaggerating the lordosis. The slipping upward of the head of the femur on the oblique plane of the dorsum of the ilium, widens the distance between the two femora, thus showing a very distinct gap between the thighs. There is no interference with the movements at the hip because of the laxity of the ligaments. The patient may walk fairly long distances only complaining of being somewhat tired. It is also rather surprising that some of these cases with such a seemingly severe defect, are capable of so much exertion.

In the case of anterior displacement where the head lies under the anterior superior spine, the symptoms are not nearly so noticeable. There is practically no lordosis, and while there is some shortening, and therefore some drooping of that side in walking, there is not the same give and not so distinct a waddle.

Diagnosis. The diagnosis is comparatively easy. The gait, as suggested before, is almost pathognomonic. The differential diagnosis is between congenital dislocation of the hip, coxa vara, and an old pathological dislocation due to septic arthritis of childhood, or possibly tuberculous hip-joint disease. The history of the condition ought to eliminate the pathological condition due to disease, and the diagnosis between coxa vara and congenital dislocation is made entirely by the fact that in the one instance the head can be felt definitely outside the acetabulum, and in the other case in its place. In coxa vara also, the rotation of the femur takes place with the head of the bone as the centre of the circle, the neck forming the radius, and the trochanter the circumference; while in the congenital dislocation the head is a less fixed point than the trochanter, and consequently on the rotation of the shaft of the femur, the trochanter acts as the centre of the circle, with the neck as the radius as before, and the head sweeps round as the circumference.

Treatment. In our experience at the Hospital for Sick Child-

ren, Toronto, about 75 per cent. of the cases under eight years of age can be reduced by manipulation, and a perfect anatomical and functional result obtained. In possibly a small percentage of cases the head is not retained in the acetabulum but slips forward as an anterior transposition, giving what may be called a functional cure but not an anatomical one, the chief defect being a small amount of shortening which necessarily remains.

In some 5 per cent. of cases it has been found necessary to make the reduction by operative means. The chief hindrances to the re-position of the head as found in such operation, has been the thickened and contracted condition of the capsule. By making a free crucial incision through the anterior portion of the capsule, a grooved instrument, similar in character to a shoe spoon, may be introduced, the end of the instrument reaching the margin of the acetabulum, and the head of the femur may be "skidded" along this hollow into the socket.

The manipulation as earlier described by Lorenz was of rather a severe character, and in the opinion of most of the surgeons doing a large practice of this type, mostly unnecessary. The method of treatment was forcibly to abduct the already flexed thigh, either tearing the adductor muscles from their attachment, or through the muscle substance, producing often a large hæmatoma, and occasionally tearing the obturator nerve. With the same severe trauma the extended leg is completely flexed on the body so that the limb lies almost alongside the trunk. Then with the limb over the edge of the table, the femur is hyper-extended—the object of all these high grade manipulations being to produce a marked flexibility at the hip. When this flexibility is complete, traction has to be made upon the thigh and forcible abduction. A V-shaped block is placed under the trochanter so as to act as a fulcrum, the shaft of the femur being used as a lever to spring the head over the posterior margin of the acetabulum into its socket. This re-placement of the bone usually takes place with a fairly distinct snap, so that there is no question about its reduction. The limb then is put up in plaster in what Lorenz calls the "frog" position, the thigh being extremely abducted and rotated outward, a plaster of Paris spica being applied to a point just below the knee.

This method has been largely modified by most of us, and the one adopted by us is to make less marked forcible abduction in an endeavour to produce as little trauma about the hip as possible, and it is usually found that the head can be successfully replaced without the preliminary extreme stretching advocated by Lorenz.

The limb also is put up in a position of moderate abduction and inward rotation, thus avoiding the difficulty of overcoming the subsequent extreme rotation of the limb.

A very necessary feature—and one which the writer would like to emphasize in the treatment of these cases—is the care subsequent to the reduction and the application of the plaster. It is essential in order to get a good functional result that the child be put upon its feet as quickly as possible. This is to encourage the bone growth and to prevent atrophy, and at the same time by the pressure of the head in the acetabulum to deepen the cavity and adapt it to the shape of the head of the femur.

In the cases of single dislocation, this is comparatively easy, as the child can get about with the one limb thus moderately abducted. In the bilateral, it is impossible of course for the child to walk, but some effort at locomotion can be attempted by making a special chair wide enough in the seat so that the child may sit astride it and just high enough so that the feet will touch the floor. If castors are put on a chair of this sort, the child soon learns to go about freely, and in this way gets a large amount of exercise.

In the original position of Lorenz, these plaster spicas had to be left on for from four to five months before being changed. In the modified position of abduction and internal rotation, the plaster may be changed in two months and the angle of abduction very markedly decreased, so that in the course of five to eight months the limb can be brought down parallel with its fellow.

The early results, as published by Lorenz, showed about 50 per cent. of cures. By the method adopted as described above, we have been able to produce anatomical and functional cures in approximately 75 per cent., and functional cures from anterior transpositions in about 10 per cent. Some 5 per cent. have been subjected to operative interference with good results, and the remaining 10 per cent. have been either unimproved, or have resulted in ankylosis.

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THIRTY-TWO patients were admitted to the Brant Sanatorium, Brantford, during the past year. The total cost of maintenance amounted to $5,964.95 towards which sum a grant of $1,159.71 was received from the government.

# OBSERVATIONS ON A SPOROTHRIX BEARING SOME RESEMBLANCE TO THE SPOROTHRIX BEURMANNI

By George E. Learmonth, B.A., M.D., C.M.

*High River, Alberta*

DURING recent years there has been an increasing amount of investigation and of research on the subject of the cutaneous mycoses. Probably none of the diseases of this class is deserving of more attention than sporotrichial infection or sporotrichosis. Medical literature of the past few years, especially that of the United States and of France, is replete with references to this subject. In the former country mention should be made of the names of B. R. Schenck[1] who in 1898 discovered an organism in a case of intractable multiple abscesses of the hand and forearm which proved to be a fungus of the genus sporothrix or sporotrichum; of Hektoen and Perkins[2] who confirmed Schenck's find in 1900 and termed the organism *Sporothrix* or *Sporotrichum Schenckii*. Of the others who have contributed notably to our knowledge of the subject are Trimble and Shaw[3]; Stelwagon,[4] Pusey,[5] Hyde and Davis,[6] Sutton,[7] Hamburger,[8] and others. In France de Beurmann[9] has probably done more investigating and research than any other on this subject. In 1903 he reported having found a species of sporothrix differing materially in certain cultural and morphological characteristics from the sporothrix schenckii. In 1906 Matruchot and Ramond[10] experimenting with this fungus suggested that the term sporothrix beurmanni be applied to it. Investigation during the past three years has proven that the differences between the sporothrix schenckii and the sporothrix beurmanni are not great. As much controversy has arisen over this point I will allude to it later when I discuss the classification of the sporotricha. Other well-known French investigators on the subject have been Gaucher,[11] Monier-Vinard,[12] Jeanselme,[13] Gougerot,[14] Duval[15] and many others.

Up to the close of 1912 Hamburger[8] ascertained that reports of

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Read at the Annual Meeting of the Alberta Medical Association, Medicine Hat, July 6th, 1914.

this disease came from fourteen of the States with a total of fifty-eight cases. In France up to this time there had been over one hundred recorded cases. From 1912 to the present many new cases have been reported in both these countries. In England I have found mention of only three cases, by Von Openheim,[16] Adamson[17] and Low.[18] Some of the American cases occurred in States close to our three prairie provinces, viz., in Minnesota, Dakota and Montana. Notwithstanding this fact no record is obtainable of its occurrence in the Canadian West, or for that matter anywhere in Canada. Hence one must conclude that either the disease is rarely met with here or that cases have passed by unrecognized. As its recognition depends in a great measure on cultural and on microscopical methods I am inclined to believe that if such methods are adopted sporotrichosis will be found to be not rarely met with. During the past three years since I have been on the lookout for the disease I have seen two cases.

Clinical Manifestations.—According to the classification of de Beurmann[19] there are three main clinical forms:

1. Sporotrichosis with disseminated gummata: under this caption we have (*a*) the non-ulcerative form, (*b*) the form with large multiple abscesses.

2. Localized sporotrichosis in the form of a deep ulcerating gumma.

3. Extra-cutaneous forms affecting many of the viscera.

For several years the generally accepted belief was that the affection was purely cutaneous or epidermal in nature. This idea has been dissipated, just as in blastomycosis and other diseases of a granulomatous or fungoid character which further investigations have proved to be productive of a systemic involvement. This is evident in the cases reported in France, where muscles, bones (with osteitis and periosteitis), joints, the pharynx, larynx, lungs, kidneys, the conjunctiva, and the iris have been singly or otherwise involved. The sporothrix has been found in the sputum and in the blood occasionally causing a septicæmic sporotrichosis. In all of the American cases of which I have record with two exceptions the disease has been cutaneous, belonging to Class 1 of de Beurmann's classification. In the two exceptions mentioned the conjunctiva was affected; these were cases reported by Gifford[20] in 1910 and Wilder and McCullough[21] in 1914. There is little doubt but that when the disease is more fully studied in the United States and Canada as it has been in France, especially in the country districts where it is most prone to occur, visceral involvement will

be found to be present. It is significant that horses, mules, dogs, cats, rats are readily infected. Added to this, the fact that experiment has shown that saprophytic growth may take place on vegetables and fruits is proof of the widespread occurrence of the mould. One further point I would emphasize, and that is the simulation which the disease occasionally presents to a syphilitic gumma or syphilitic ulcer which would deceive the elect, more especially since potassium iodide acts almost as a specific. In such cases a Wassermann test should be made. According to Cappani,[19] the so-called sporo-agglutination test of Widal and Abrami or the complement deviation test may be useful though both these are positive to other mycoses than soporotrichosis. Sutton[22] has called attention recently to its resemblance to blastomycosis. Tuberculosis of the skin is also with some difficulty differentiated.

A brief description of the average case reported in the States is as follows:

Infection usually occurs in a young male, most frequently a farmer or farm hand, with a history of a previous abrasion or injury to the skin surface. It begins with a small nodule about the size of a split pea, lying under the skin. About a week following the appearance of the nodule others appear in a line farther up the limb than the first. These tumours gradually harden and in a few weeks' time break down, discharging a small amount of brownish viscid pus. Ulcers are formed which continue to discharge. These are painless. There is usually no lymphangitis with enlarged glands.

In all of the American cases the organism of Schenck has been isolated, with the exception of the Hyde and Davis case. In 1912 de Beurmann and Gougerot compared cultures of the Hyde and Davis case with those of the sporothrix beurmanni They concluded that the Hyde and Davis cultures, if not identical with those of de Beurmann, were at least the connecting link between the sporothrix schenckii and the sporothrix beurmanni.

The sporotricha, according to recent classifications,[23] are placed among the hyphomycetes or fungi imperfecti which belong to the family of thallophyta, plants showing no differentiation into distinct parts as root, stem, and leaf. The fungi imperfecti are so termed inasmuch as their fruiting bodies have not been sufficiently studied.

I will present to you, as briefly as is consistent with the time allotted for this paper, the features of the Schenck organism, and then make a comparison with the sporothrix beurmanni.

Schenck's Organism.—Whilst the fungus is readily grown

and observed in culture from the exudate, yet in the tissues it is with difficulty that it is discerned. According to Taylor, by using a modification of the Gram stain the organisms can be demonstrated at the periphery of the areas of necrosis. Taylor's method is to steam for one minute with the anilin methyl violet and counterstain lightly with alcoholic eosin instead of aqueous fuchsin.

Stained by this method the spores are typically cigar-shaped, often showing dark bands or having a granular appearance. There are often marked variations in the contours of the spores. The mould grows readily at room temperature and is ærobic. A profuse growth is obtainable on most of the commonly used culture media and is usually seen four to eight days following inoculation of the tubes. A small grayish-white, thread-like colony appears usually earlier on blood-serum and later on such media as agar-agar. On those media containing sugar the growth is especially prolific. Several colonies appear which gradually coalesce, forming an elevated, pale-gray layer which later becomes corrugated with a sticky soft surface. Cultures turn a dark brown after three or four weeks.

Morphology of the Spore.—The organism consists of an abundant branching septate mycelium, 1·5 to 2 microns in diameter, with clusters of pear-shaped spores. It stains well with all the basic dyes, and is not decolorized by Gram's stain. The organism grows by an elongation of the spore which usually divides in two. Buds push out from one or both of these new spores and grow rapidly, forming the mycelium which radiates from the centre. In young cultures one or two days old the germinating spores may be seen in large numbers. At one side of the spore a bulging of the wall occurs, marking the site of the growing filament which continues to extend rapidly and give off branches, which extend at right angles to the growing filament. I have drawn on Taylor's[24] article for much of this description of the sporothrix schenckii.

The main differences between de Beurmann's fungus and the above are as follows: (1) The presence of chlamydospores, or sac-like enlargements of the mycelium, containing spherical bodies. (2) The greater number and pedunculated nature of the spores borne on the mycelium. (3) The infrequent branching of the mycelium. (4) The lack of the parallel arrangement of the mycelial threads, characteristic of the sporotrichum schenckii. (5) The fermentation of saccharose.

From very close study and observation of both these sporotricha the views at the present time held by competent observers

are that both forms are derived from the same stock, but represent different types. As cultural methods, such as the employment of the Saboraud glucose-agar culture, have much to do with the growth and morphological changes of the fungus, it is possible that both strains are identical.

CASE REPORT.—The case which I now present with cultural and microscopical findings is as follows:

I was consulted December 16th, 1911, by E. D. S., male, aged thirty-one, married, farmer by occupation. He complained of a sore on the left arm.

HISTORY OF PRESENT ILLNESS.—About one week to ten days previously he noticed a small, red, raised area about the size of a pea some two inches above the left wrist joint. This reddened area increased to the size of a ten-cent piece, broke down, discharging a brownish-yellow exudate, and the cavity gradually extended in depth and in width. There had been but very slight pain. The patient had always enjoyed excellent health. There is absolutely no history of any venereal infection. He is the father of four healthy children. His habits are good. There is nothing of interest in his family history.

General examination revealed nothing further than the local lesion on the left forearm.

About two inches above the left wrist joint on the inner surface, about three-quarters of an inch from the ulnar border, is a deeply-excavated, ulcerated area, about half an inch in diameter. The edges are raised above the surface, are not indurated, though firm, and are not undermined. There is a considerable amount of granulation tissue about the upper inner edge. The exudate is of a brownish-yellow colour. There is no pain complained of, nor is there apparently any tenderness on curetting the surface of the ulcer. Neither the epitrochlear nor the axillary glands are enlarged.

A smear taken from the exudate and stained with gentian violet did not show the short granular rods, which are usually demonstrated with difficulty. Cultures were taken on glucose agar, Löffler's blood-serum, broth, nutrient agar and nutrient gelatin, Having in mind chiefly the possibility of a sporotrichial infection, I left the tubes uncovered and at room temperature. On the fifth day I noticed a few small grayish-white growths on the glucose agar and on the blood serum. These gradually coalesced in each tube, forming a thick furry growth. At the end of some two weeks the cultures turned a dark brown colour. The growth in broth after

about six days was noticed as fine flaky particles at the bottom of the liquid. The growths on nutrient agar and nutrient gelatin were not as profuse as on the blood serum and glucose-agar, appearing only about the seventh or eighth day.

MICROSCOPICAL APPEARANCES OF THE GROWTHS.—Numerous small round or ovoid spores of double contour are seen, and are a little more than half the size of a human red corpuscle. They have a refractive appearance, are of a slightly yellowish colour, and are arranged singly, in clusters and in chains of twelve to fourteen. Budding forms are seen, apparently the same as depicted by Hyde and Davis.

The mycelium is somewhat broad, jointed, branches freely, usually at an acute angle, and the ends of the branches are laden with numerous newly formed spores. In some of the older cultures large ovoid, almost cigar-shaped, forms are seen. Stained with mythelene blue, gentian violet, thionin blue, carbol fuchsin, the spores take the stain well. In the growing mycelium a darker band is seen extending through the mid portion of the spores. Stained by Gram's stain the organism is not decolorized. The mycelium does not take the stain as well as do the spores. Clear areas are seen about the central portion.

For further observations and advice I am much indebted to Professor Nicholls, of McGill University. He found that a better growth was obtained in the incubator than at room temperature, and that the organism was strictly aerobic, growing well on the various media which he tried, and did not produce gas or acid on glucose, saccharose, lactose and mannite broths. It grew well on plain and glycerinated agar, and blood agar, which gradually turned brown. Professor Nicholls also inoculated a mouse, but with a negative result. He identified the fungus as a sporothrix, but unlike the Schenck form.

I have concluded that this organism differs materially from both the Schenck and the de Beurmann types, though bearing a stronger resemblance to the latter.

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The College of Physicians of Philadelphia announces that the next award of the Alvarenga prize of two hundred and fifty dollars will be made on July 14th, 1915, provided that an essay deemed by the Committee of Award to be worthy of the prize shall have been offered. Essays for competition must be received by the secretary of the college on or before May 1st, 1915. Any subject in medicine may be chosen, but the manuscript must be typewritten and, if in any other language, must be accompanied by an English translation. Each essay must be sent without signature and must be plainly marked with a motto and accompanied by a sealed envelope having on its outside the motto and within the name and address of the author. The prize last year was awarded to Dr. H. B. Sheffield, of New York, for his essay entitled, "Idiocy and allied mental deficiencies in infancy and early childhood."

# NOTES ON GLAUCOMA

By Percy G. Bell, B.A., M.D.

*Winnipeg*

THE subject of glaucoma is an interesting one to surgeon, physiologist and medical historian. The disease was known (though with little accuracy) in ancient times and a little consideration shows how terrible it must have been throughout the ages on account of its mysterious nature and dreadful results. The suffering and loss of sight which have been involved give it a very considerable rôle in the history of medicine.

Glaucoma to-day is a very important disease, occurring amongst every race and in every climate. Fuchs states that about one per cent. of all eye disease is a simple glaucoma. In this connexion local conditions are rather interesting. In the Winnipeg General Hospital in the year 1910 of 150 eye cases admitted for treatment 2·7 per cent. were diagnosed as glaucoma in some form. In 1911 a slightly greater number of in-patients gave the percentage as 1·9. It seems probable that eye clinics should yield a somewhat higher percentage now that improved methods of diagnosis, such as tonometry, are in vogue.

Within the last few years increased activity in glaucoma research has been productive of many new operations and of increased interest in the subject. The recent advances are brought strikingly to mind if one remembers that ten years ago glaucoma therapy was practically at a standstill, having progressed but slowly since the introduction of iridectomy as a curative measure nearly fifty years before. In the words of Priestly Smith, "The operative treatment of glaucoma has undergone more improvement during the last five years than during the previous fifty." With the practical application of the filtering cicatrix a fresh enthusiasm sprang up and the present activity is such that, as Elliot has remarked, "The present time may be spoken of in ophthalmological history as the 'glaucoma age.'"

As to the pathogenesis of glaucoma leaving aside the secondary

Read at the Meeting of the Eye, Ear, Nose and Throat Section of the Winnipeg Medical Society, March 9th, 1914.

type of the disease where such gross lesions as adhesions of the iris, etc., are manifestly sufficient to cause a blockage of the filtration channels and a consequent rise of tension, what is the present opinion on the etiology of the chronic simple form? In spite of a considerable amount of recent work done on this subject in various parts of the world, it must be confessed that Priestly Smith's words, written years ago, still define our limitations. "Glaucoma is increased tension of the eyeball plus causes and effects." Risley, of Philadelphia, has recently contributed a thoughtful and suggestive inquiry (*Ophthalmology*, February, 1914) into the matter, in which he inclines to put the whole on the plane of a toxæmia. Various theories have been offered from time to time, such as the hypersecretion, retention and arteriosclerosis. At present we must feel that the final word remains to be said on the matter; there is no doubt that the causes of primary glaucoma are various and complex and the path to their understanding lies through continued research.

A word or two on some points of anatomy and physiology. It is apparent that tension of the eyeball depends upon the pressure within it and the elasticity of the walls. It has been found by analysis of fluid in the aqueous and vitreous chambers that it differs from the lymph in its relative poorness in proteins, richness in salts and absence of lymphocytes (Collins and Mayou). Injections of fluorescëin into the circulation have proved that the intra-ocular fluid is secreted by the ciliary body. It is a true secretion and not merely a transudation, and hence may be found at a higher pressure than the blood in the intra-ocular veins. In this relation some researches recently carried out by Craggs and Taylor in Elliot's clinic (*Ophthalmology*, June, 1913) are interesting. In order to establish whether there is any relation between arterial and intraocular tensions, the blood-pressure of seventy-five glaucoma patients was carefully taken. The conclusion reached was that high arterial tension is not a necessary or even leading factor in the etiology of glaucoma. Parsons in his monograph on the "Ocular Circulation" deals with several important physiological facts. He points out that while the branches of the ophthalmic artery enter a closed box (the eyeball) in the same way as do the arteries entering the cranium, yet there is this important difference, that the walls of the former are not rigid, but that the eyeball may be changed in form, within limits, by forces acting from within and from without. Under normal conditions the contents of the globe exert a pressure of between 20 and 30 millimetres of Hg. above the atmospheric

pressure, so that the ocular vessels are subjected to about that extra pressure on entering the eye. According to Starling, the capillary pressure in most parts of the body is about 15 to 20 mm. Though we have no means of measuring the ocular capillary circulation in man, yet it is apparent that to overcome the normal pressure, the capillary pressure must be far above 20 to 30 mm., and we will probably be not far wrong in considering it equal to 40 to 50 mm. Thus it would seem that it has the highest capillary pressure of any organ, at rest, of the body. The various efferent channels of the eye act as a system of filters. The main channels are the lymphatics of the central artery, the crypts of the iris, communicating with the iritic veins and, chiefly, the channels at the angle of the anterior chamber which discharge into the canal of Schlemm and its affiliations. Any pathological change which reduces the effective lumen of the parts of this system, or any alteration in the consistency of the aqueous, tending toward making filtration more difficult, will of course tend towards production of high tension in the eyeball.

A short consideration of the instruments used in diagnosis may be of interest. It would be idle at this meeting to remark upon the value and scope of such instruments as the ophthalmoscope and perimeter—they are associated with any idea of glaucoma. The question of tension immediately suggests the tonometer. It has long been felt that the old method of recording tension by the finger was not exact enough. Not only would the judgement of equally capable observers differ, but it seems fair to suppose that it would vary in the same observer, from time to time, for various causes. One has seen, in a large clinic, the different opinions on degree of tension recorded by a dozen men in examination of the same eye. Then in some cases of chronic glaucoma it is just the slight rise that is so important, especially in interval examinations, and here the fingers are not exact. Elliot, speaking of this matter, says of his clinic: "The feeling amongst us is that one might just as well guess at a patient's temperature by passing one's hand over his skin as estimate his ocular tension by the finger method alone." There are various tonometers on the market. Of those employed by direct contact with the eyeball, that invented by Professor Schiötz, of the University of Christiana, is probably the most widely used. It is a delicate instrument, carefully made and easy of use and its readings can readily be made in mm. Hg. by use of a simple chart. It has been widely used in Europe and America for the past three or four years. Other tonometers which are employed over the closed

lids have not enjoyed much popularity. As to what constitutes normal tension, most observers seem agreed on about 23 to 27 mm. Hg. A tension of 30 to 40 would probably correspond to the sign T ? in the old method. In a few cases of chronic glaucoma simplex one has found a reading of about 60 mm. Hg., where probably T + 1 would express the result. The tension of an eye is not the same as the intra-ocular pressure, though the two are intimately related. Transillumination of the eye has been practised for some years past. In 1884 Lange described a method whereby he focussed a gas-flame, by means of a lens, on the sclera, after the pupil had been dilated with atropine. Sachs in 1903 and Würdemann (1908) invented electric lamp transilluminators. At first the method was used solely for diagnosis of intra-ocular tumours but lately has been employed for inspection of the condition of the tissues of the filtration angle in glaucoma. Contributions have been made by several investigators but it seems yet a little too early to dogmatise on the value of the results. There would appear to be a useful though limited sphere for the fundus camera in glaucoma work. In certain cases of simplex a series of photographs showing condition of the optic nerve and vessels, from time to time, might easily prove of service. The apparatus is, however, very expensive and could be maintained only at the large centres.

In any attempt at an estimation of the new glaucoma operations, it is necessary to understand a little of the history of the subject. First, to go far afield, let us go back to one of the early oculists, George Bartisch, of Königbruch, in 1583. His opinion of his art comes down to us somewhat as follows: "Every oculist should be an honest and God-fearing man and should have studied Latin and the anatomy of the human body, especially that of the eye." In 1728 William Cheselden, surgeon to St. Thomas', London, performed the first operation for establishing an artificial pupil, and it was not until seventy years later that Joseph Beer performed the operation of iridectomy, practically as it is known to-day. Von Helmholtz in 1851 helped to place ophthalmology on a firm footing by the discovery of the ophthalmoscope, and five years later von Graefe, who has frequently been called the founder of modern ophthalmology, applied iridectomy to the relief of glaucoma. In the course of time examination of a large number of pathological specimens operated upon, showed that those in which the drainage was through a cystoid cicatrix were the most successful. In 1901 De Wecker made a report to the French Ophthalmological Society on the results of producing an intentional incarceration of

the iris and Parinaud in the discussion which followed, stated that he had endeavoured to make filtering scars after iridectomy by the same method. The conviction was slowly gaining ground that though the classic iridectomy was the best operation for cases of acute glaucoma, it left much to be desired in the chronic form. As the result of this the new glaucoma operations were gradually introduced, the object in all, irrespective of method, being to produce a slow permanent escape of aqueous. In 1903 Herbert published an analysis of 130 cases showing his results by leaving prolapsed iris in the scleral wound. He found the results more satisfactory than those obtained with simple iridectomy. Later he introduced his wedge-isolation operation (a modified sclerotomy) and has still further modified this lately by a triple incision subconjunctively through the sclera—the aim being to procure some shrinking of the scleral wedges on healing and consequently filtering cicatrices which communicate between the aqueous and the subconjunctival lymph spaces, in other words a sort of circulation anastomosis. Bishop Harman has modified this operation by performing the sclerotomy with twin scissors, and many similar modifications have been made.

All the different operations now in vogue aim at producing a filtering cicatrix in one of three ways: (1) by the entanglement of iris or other tissue in the wound; (2) by forming the wound in such a way that it tends to remain patent; or (3) by excising a portion of the tissue in some manner.

Heine, of Breslau, in 1905 introduced the operation of cyclodialysis. An incision was made with a straight lance-knife in the sclera a few millimeters outside the limbus and then a spatula was introduced through the wound into the anterior chamber, breaking through the ligamentum pectinatum, the object being to form a communication between the anterior chamber and the suprachoroidal space.

In 1906 Lagrange, of Bordeaux, brought forward his operation for sclerectomy, which is too well known to need any description. He recommends it in cases of chronic simple glaucoma. If the tension is low no iridectomy is done, but if it is higher, say roughly within the limits of +1 to +3, the combined operation is performed. Lagrange's operation is in very great favour on the Continent. The basic idea of a sclerectomy seems to be largely to this operator's credit.

On August 2nd, 1909, Lt.-Col. Elliot, I.M.S., of Madras, performed his first trephining of the eye. A similar operation had been

performed two months earlier by Dr. Freeland Fergus, of Glasgow, but the latter combines a cyclodialysis. Elliot has had a large experience in his clinic, nearly 900 cases having been operated upon. His object has been to form a permanent drainage between the anterior chamber and the sub-conjunctival space. He believes that trephining a disc of sclero-cornea (1·5 to 2 mm. diameter) at the limbus after reflection of a large flap of conjunctiva, and his manœuvre of "splitting the cornea", fulfil the need of drainage, with at the same time the minimum of traumatism to the eye. A small iridectomy through the trephine hole is done. Elliot's careful statistics show that he has had remarkable success. That in this and other operations, there is truly a filtering cicatrix left is shown by the spot of conjunctival œdema which persists at the site of operation. Elliot trephines in cases of both acute and chronic glaucoma, in glaucoma secondary to cataract, in staphyloma, conical cornea and glaucoma secondary to leucoma adherens or occlusion of the pupil, etc., considering it a superior operation to simple iridectomy. In Elliot's recent book on the subject, full details are given of the methods of diagnosis, operation and after-treatment, as well as articles by various authorities on the historical and comparative considerations of the different recent operations. Trephining is in the main a simple operation but its success depends on minute attention to detail. For example, Elliot's success—his percentage of failures (to 1913) being given as 4·6 only—seems to be due to extremely careful working up of his subject and the greatest attention to every step of operative technique and after-treatment, added to which is, of course, exceptional operative skill.

In 1912 at Moorfields, one saw that Elliot's operation had almost entirely superseded that of Herbert. Wallis, late senior house surgeon of the hospital, has contributed an interesting paper on the results of trephinings carried out by the different members of the staff, several of whom had departed somewhat from Elliot's exact routine. Out of ninety-one patients suffering from primary chronic glaucoma, the case percentage of failures was 9·8, while the operation percentage of failures is 15·3.

Amongst other recent operations for glaucoma I should just like to mention Bettremieux's simple anterior sclerectomy, where thin shavings of the sclera are removed with the idea of producing an anastomosis between the deep scleral and superficial conjunctival vessels. Abadie's ciliarotomy is also worthy of notice. This operator, believing that certain cases of glaucoma are due to the irritation of the ciliary nerve plexus, endeavours to produce an

"anti-glaucomatous reaction" by division of the nervous circle. It is not necessary to dilate upon the time-honoured posterior sclerotomy either as an operation *per se* or as a forerunner to iridectomy or other surgical interference.

Any comparative estimate of the various new operations is, at present, extremely difficult. Last year at the 17th International Congress of Medicine in London, Priestly Smith communicated the results of an inquiry he had instituted amongst members of the Ophthalmological Society of the United Kingdom. Three questions were asked as follows:

"What operation or operations, if any, do you at present perform in place of the classical iridectomy, and with what advantages, (*a*) in acute primary glaucoma; (*b*) in chronic primary glaucoma (glaucoma simplex); (*c*) in congenital glaucoma (buphthalmos)?"

One hundred and twenty answered, and the following is a brief abstract of the replies: (*a*) In acute primary glaucoma iridectomy was still in use by 101. There were various methods of iridectomy. Nineteen combined posterior scleral puncture with the operation. Trephining was adopted by nine. (*b*) In chronic primary glaucoma, iridectomy is now habitually practised by only thirty-one out of the 120. Herbert's "trap-door" operation has seventeen adherents. Trephining is now decidedly the favourite operation, it being placed first with fifty six. (*c*) Concerning buphthalmos, thirty-three of the 120 are silent; amongst the others, some are gloomy of any results, while others pin their faith to iridectomy, Herbert's operation and trephining.

In comment the author says, "Further experience will doubtless bring further change of practise . . . . but it is unlikely that any one method will ultimately exclude all others. On the contrary, it is likely that better knowledge of causation will lead to a discriminating choice of different methods for different forms and stages of glaucoma. Improvements in the operative treatment, however great, can never dim the lustre of von Graefe's great achievement. He cured a disastrous malady that had never been cured before."

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A HOSPITAL has been opened at Juneau, Alaska, by the Sisters of St. Ann, at a cost of $60,000.

## Case Reports

### CARCINOMA OF THE BREAST IN A MAN WITH APPARENTLY HEALED MILIARY TUBERCULOSIS

By L. Bruce Robertson, B.A., M.B.

*Toronto*

THE following case was thought of sufficient interest to report on account of the uncommon pathological conditions present at the same time.

R. W., an American aged sixty years, night watchman, was admitted to the First Surgical Division, Bellevue Hospital, New York, on September 26th, 1912. His complaint on admission was rupture, and local examination at the time revealed the presence of a right inguinal hernia. One sister had died of pulmonary tuberculosis. One daughter is living and in good health. One died in childhood following chronic bone disease, but the patient could not state whether it was tuberculous or not. He denied venereal disease, and had been a moderate drinker up to thirty-five years ago. The history relating to his hernia was vague, and he could not state definitely the time of its appearance. When questioned as to a tumour which was present in the left breast, he stated that some sixteen years before, he had noticed several blisters over the chest, one of them being in the region of the left nipple. The etiology of the blisters was unknown. Various sorts of treatment were indulged in, and the lesions elsewhere than in the left nipple disappeared. Very gradually a tumour formed, invading the left nipple, and increased in size very slowly. The tumour was painless, but occasional pains had been noticed in the left shoulder. There had been no noticeable discharge from the affected nipple, and no glandular enlargement had been noticed in the left axilla. There was no history of trauma to the left breast.

His general health had been fair, and there was no history of any serious illness. A slight cough had been present for some time but had not bothered him to any extent, and he had never noticed any bloody sputum.

Physical Examination: Patient is a fairly well developed, only fairly well nourished man, about sixty years of age. He has

a somewhat stooping figure, though the posterior spinal curvature is not usually round. There is a slight arterial thickening, the heart sounds are clear, and the apex beat not displaced. The lungs show slight impairment of resonance at both bases posteriorly, and a few râles are present in this situation. The abdomen is flaccid and not distended, no masses can be left. The liver edge is palpable. The spleen cannot be felt. The inguinal glands on both sides are palpable and somewhat indurated. The axillary glands on both sides are moderately enlarged, discrete and painless, no enlargement is present in the epitrochlear or supraclavicular glands.

There is a hard painless tumour in the left breast surmounted by and involving the nipple. The tumour is the size of an hen's egg and stands out prominently from the surrounding tissue. The top of the nipple is occupied by an irregularly lobulated mass of somewhat soft dark red tissue, covered by a thin hairless epithelium very similar to that of the normal nipple. The skin for a short distance about the nipple is somewhat reddened and is adherent to the apical portion of the tumour but not towards the base of the latter. The tumour has no firm deep attachments. A right inguinal hernia is present, the sac descending well down into the scrotum.

A sciagraph of the chest showed no lesion of the vertebræ, and only such decreased radiability of the bronchial glands as might be expected in a man of his age.

On the day following admission the left breast was removed and the left axillary glands cleaned out, a small area being left to granulate after approximating the skin flaps. The report from the pathological department showed the breast tumour to be a medullary carcinoma; the axillary glands showed only miliary tubercles.

Two weeks later the inguinal hernia was operated upon. At the operation the wall of the hernial sac was seen to contain numerous small seed-like bodies, some soft and white, others hard and fibrous. On this account some of the adjacent inguinal glands were removed for examination. On microscopic examination both the hernial sac and the inguinal lymph glands showed miliary tubercles.

One month after admission the patient was discharged from the hospital, the breast wound being represented by a small area of healthy grandulations, and the hernia wound having healed by primary union. About five weeks later he returned to the hospital saying that in the last week or so a small swelling had appeared beneath the hernia wound and that it was steadily increasing in

size. Examination showed a superficial fluctuating swelling just beneath the hernia wound and some induration of the surrounding tissues, giving all the appearances of a tuberculous abscess. The patient's temperature and pulse were normal. The swelling was painted with a 7½ per cent. solution of tincture of iodine, covered with sterile gauze wet with 95 per cent. alcohol, and an ice-bag applied. The abscess was allowed to rupture spontaneously into the sterile dressing, and after the latter was removed three days later a dry scab had formed over the abscess opening. A sterile dressing was applied and the patient sent home at his own request. The breast wound by this time had healed altogether, except for a small area of granulation tissue.

Nothing further was heard from the patient until July, 1913, when in answer to a letter as to his condition he replied that there were two soft and somewhat painful masses in the left axilla, one of which had been discharging a considerable amount of pus for about a month. There was some limitation to the abduction of the arm. There had been slight but persistent discharge from the abscess which had occurred in the right inguinal region, but he thought that the sinus was about to close. His general health was good. He had had no cough, and had worked most of the time since leaving the hospital.

The possibility of tuberculosis of the breast was considered but the sections showed no miliary tubercles and the tumour cells showed only malignant characteristics. It is possible that the wide-spread distribution of the tubercles in the left axilla and the right inguinal glands and peritoneum, can be accounted for by a condition whose existence is not altogether accepted, namely miliary tuberculosis with recovery.

For the opportunity of reporting this case, I wish to express my thanks to Drs. John B. Walker and Arthur Vosburgh of the First Surgical Division of the Bellevue Hospital.

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THE staff of the Vancouver General Hospital has voluntarily agreed to a reduction of from 5 per cent. to 10 per cent. in their salaries, in order to help the board through the present financial crisis. The deficit for the year 1914, to the end of October, is reported as amounting to $11,811.75.

# Editorial

## A CHIROPRACTICAL JOKE

IN dealing with the bony heretics in our midst it is difficult to find the golden mean. The shortest way savours of persecution to a not uncommon type of mind. Hale him—osteopath, chiropractic, or *Eddyot*—before the judge, if the legal definition of "the practice of medicine" permits it, and the yellow-minded reporter is there to hail him before the public as a martyr to the greed of corporate interests. On the other hand, the present policy of *laissez-aller* is not free from danger to the laity and, in many districts, harm to the profession. Incidentally, it may be questioned whether the usual formula, "give him enough rope and he will hang himself," can properly be applied to one who is clever enough to make a living by replacing and keeping in place undislocated vertebræ. When, therefore, this sorry sect a few months ago proposed to establish a teaching school of "chiropractics" in Toronto, the Ontario College of Physicians did well to protest vigorously to the government, and it is to be hoped for the credit of the province that official sanction at least will be withheld.

Recently in a wide-awake little town in Ontario an ingenious attempt was made to deal with the local problem. If it failed of the desired effect, the unforeseen factor was one that has often caused the best-laid schemes to gang agley. One of the leading practitioners of the town was called in to see a young woman, whom he found to be seriously ill with diphtheria. He prepared to give antitoxin, but the patient and her people, with the obstinacy of fanaticism, would have none of it. Dr. Merrythought, having exhausted his powers of persuasion, if not of profanity, washed his hands of the

case and departed to report it to the medical health officer, his friend Dr. Sly. Thereupon the parents sent for Quackanbosh, a particularly offensive "chiropractor" who had recently settled in the town. His first visit occupied only the time necessary to replace the cervical vertebræ and unobstruct the flow of vital spirits along the nerve roots. His second visit was more protracted, lasting without interruption for a period of some three weeks. Our friends had hit upon this visit as an opportune moment for placarding the house and establishing a rigid quarantine!

So far the laurels rested with the profession; but Quackanbosh has some claim to the last laugh. It was indeed to be expected that the patient would recover. Such cases do; and for much the same reason that Montreal, having drunk more than its usual allowance of sewage lately, has fortunately been more than usually free of typhoid. But that was not all. Quackanbosh did not waste his leisure in repining. As the apothecary poet puts it, "They could not in the self-same mansion dwell without some stir of heart." He emerged from his pleasant captivity betrothed to the young lady, and is now more firmly rooted in the town, without further let and hindrance on the part of Drs. Merrythought and Sly, who were among the first to give their services to the Empire. They are now at the front, where one may hope that even as non-combatants their strategic faculties will find scope, and be attended with a less dubious success.

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## APPENDICULAR OBSTRUCTION

ONE of the puzzling features of acute appendicitis has always been the extraordinary variability in the nature and severity of the early symptoms. An interesting contribution on the pathogenesis of the disease, and one which may be of considerable clinical importance, has been made by Mr. D. P. D. Wilkie, of the Edinburgh Royal Infirmary, in a paper published in the *British Medical Journal* of December 5th.

While others have laid stress on the obstructive factor in appendicitis, he maintains that there are two clinical entities to be clearly differentiated, primary inflammation and primary obstruction. "If we set out by recognizing two definite types of acute disease of the appendix—namely, acute inflammation and acute obstruction—then not only does the understanding and the teaching of the symptomatology of acute appendicular disease become much simplified, but the early diagnosis of such disease becomes inevitably more confident and more correct." The destructive features of acute appendicular obstruction as contrasted with primary inflammation are, briefly, the great severity of the pain, the suddenness of its onset, and especially the absence of disturbance of the pulse and temperature during the initial stages. Vomiting is usually but not always present. The commonest causes underlying the obstruction are fibrous stenosis, resulting often from a previous appendicitis, and acute kinking by an abnormal band or fold, congenital or acquired. The immediate cause of the acute symptoms is the access of fæcal matter to the distal portion of the appendix beyond such a constriction.

These views are not based on clinical and pathological observations alone, but are supported by a series of suggestive experiments, which were carried out on cats, and in which an isolated loop from the lower end of the ileum was used to form an artificial obstructed appendix. The results of these experiments confirm those previously obtained by Heile, who found that when the appendix in the dog was occluded, the degree and rapidity of the morbid changes were in direct proportion to the amount of fæcal matter present. Moreover, in Wilkie's experiments not only the amount of the fæcal matter, but its nitrogenous character, seemed to have a very definite influence. If the animal had been fed on a meat diet, complete gangrene of the artificial appendix, without the blood supply being interfered with, would quickly ensue, sometimes within sixteen hours. In this connexion statistics

are quoted to show that the prevalence of appendicitis in any class or race of people is in proportion to the amount of animal proteins that enter into their diet.

The experimental results are compared with conditions found in the human appendix, and a plausible case is made out for the author's claim that acute obstruction of the appendix should be regarded as a pathological and clinical entity, a form of intestinal obstruction to be distinguished from acute inflammation because the obstructive cases demand treatment before the signs of inflammation appear.

An interesting case bearing on this question was reported by Dr. C. C. Waller, of Vermont, in the *Journal of the American Medical Association* of September 5th. It concerned a child who had had repeated attacks of severe pain in the region of the appendix. During the operation, on delivery of the apparently normal appendix, and while the anæsthesia was not very deep, the patient began straining with considerable energy, and to the operator's surprise the appendix gradually inflated to a degree near bursting. Under gentle pressure the organ was deflated and then removed. A no. 6 bird-shot was found occluding the orifice of the appendix, which was otherwise free from any indication of inflammatory changes.

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## IMPERIAL RECIPROCITY

THE question of reciprocity between the medical licensing bodies of Great Britain and Ontario, to which reference was made in these columns two months ago, gives promise of reaching a satisfactory settlement. It was felt by some that, in view of the emergency which exists, and if only as a matter of courtesy, the General Medical Council of Great Britain might be in a position to relax its regulations so as to allow, for instance, a physician licensed in Ontario to practise temporarily with the British Red Cross. This has not been found practicable. Meanwhile the College of Physicians and Surgeons of Ontario has taken action, and at a meeting of the

Council of the College, held on December 22nd, it was unanimously agreed that the legislative committee should obtain from the Ontario Government at its next session the powers necessary to enable the College to reëstablish reciprocal relations between the Ontario Council and the General Medical Council of Great Britain. It seems reasonably certain that any disadvantages which might possibly result to the profession in Ontario will be more than outweighed by the removal of the anomalous restrictions on the patriotic activities of some of its members, to which the present situation has called attention.

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THE present war has made it necessary to suspend publication of the *Revue de Médecine* and the *Revue de Chirurgie.* At the close of hostilities, however, publication will be resumed and the numbers due for 1914 will then be sent to subscribers. As soon as it is possible to do so, the periodicals will appear under the same conditions as before.

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ACCORDING to reports in the daily press, there is a great deal of smallpox in the neighbourhood and city of London, Ontario. It is stated that children suffering from the disease have been allowed to attend school and that thus the infection has spread throughout a wide area. It is suggested that failure on the part of physicians in attendance to report cases is largely responsible for the present condition of affairs. An investigation is being made by Dr. Bell of the provincial board of health.

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The amendment recently made to the Municipal Act as affecting hospitals in the province of Saskatchewan excites some comment. The amendment provides that a municipality shall care for any sick person who has been resident there for at least thirty days and who is unable to procure necessary medical attention. If the patient is received by a

hospital, however, payment by the municipality is made contingent upon the fact that the patient was admitted to hospital on the request of the municipal council, the reeve, or the secretary. The amendment applies to country districts only where distance often makes it impossible for a sick person to go to any municipal officer. In case of sudden illness, a hospital could not refuse to admit the patient even though he had not received permission from a municipal officer to enter the hospital and yet the hospital would be unable to obtain any remuneration from the municipality to which the patient belonged. The matter has been brought to the attention of the government and it is understood that the wording of the amendment will be changed at an early date.

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THE first of our Canadian practitioners to give his life for the cause was Dr. Fernand Louis de Verteuil, of Vancouver, a notice of whose death appeared in the JOURNAL of November. He was a surgeon in the Royal Naval Reserve, and joined the ill-fated cruiser *Good Hope* in August. Dr. de Verteuil belonged to a family well known in the West Indies, and had held a position in the Trinidad medical service before settling in Vancouver. He studied medicine at Edinburgh and at King's College and St. Thomas's Hospital, London. He took the M.R.C.S., L.R.C.P., Lond., in 1904, and the degree of M.D. at Edinburgh in 1909. Dr. de Verteuil was the author of several papers dealing with tropical diseases, including an article on leprosy which he contributed to the JOURNAL. He was the translator of Maisonneuve's "Experimental Prophylaxis of Syphilis." His loss will be felt by the Association, in whose welfare he took an active interest.

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A LIST showing the losses suffered by the medical services of the German army has been published in the *Wiener Medicinische Wochenschrift.* The total casualties up to November 16th are given as 287, of whom 94 were killed, 12

died, 27 were prisoners, and 64 missing. No such figures seem to have been issued up to the present from the allied armies. In the first British casualty lists, especially those covering the famous retreat, the proportion of R.A.M.C. officers killed was astonishing. In one long list 10 per cent. of the officers killed were medical men. Since September, however, the proportion has, fortunately, not seemed unduly large. With regard to the prisoners, one reads of complaints, emanating from both sides, that surgeons and Red Cross officers captured are being wrongfully detained. According to the Geneva Convention such prisoners may be held as long as there are prisoners of their own nationality requiring their professional care.

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An ancient projectile in a new form has made its appearance in this ultra-modern war. This is the steel arrow, which has been dropped, sometimes in veritable showers, by the aeroplanes of the Allies upon groups of astonished Germans. The arrow is about five inches long, the lower third being solid and tapering to a sharp point, while the upper two-thirds, composing the shaft, are flanged. Dropped from a height of fifteen hundred yards they reach the ground with a velocity equal to that of an old-fashioned bullet, and that they are capable of inflicting serious wounds is shown by the accounts of German surgeons. In one instance such an arrow entered the supraclavicular fossa and came out at the knee!

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A bacteriological investigation of the milk supply of Montreal was undertaken in 1913 by Dr. F. C. Harrison, principal of Macdonald College, Dr. A. Savage, and Mr. W. Sadler. The report, which has recently been issued, is comprehensive and the result of careful and conscientious investigation. A study was made of the manner in which the milk was produced, transported, and retailed to the city of Montreal;

and the authors aver that the results of these studies are "set forth with nothing extenuated nor aught set down in malice." The report is of particular interest in view of the great mortality among infants in Montreal, equalled only by that of Chili, and the conclusions reached by the authors are far from encouraging. The milk, both in summer and winter, is branded as *bad*—of very poor hygienic quality. "It is grade D milk, milk which should not be permitted for sale, and which would be unhesitatingly condemned by any city with even a low standard." In considering the causes of such conditions, the authors are of opinion that too little incentive is offered to the farmer to keep his milk clean and sanitary, for, unlike all other farm produce, which is paid for in accordance with its quality, milk is not graded and a pure milk brings in no more to the farmer than does milk in the production of which no care has been exercised. The price of milk, as compared with other foodstuffs, is considered too low and the farmer's remuneration inadequate. The evils of transportation, often in open cars in the hot weather, the ignorance and negligence of dealers, and the lack of care in the treatment of utensils, are all taken into account and the report closes with an earnest plea that certain amendments be made to the legal statutes of the province of Quebec and the regulations and by-laws of the city of Montreal, in so far as the sale and distribution of milk is concerned.

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A SCHOOL of Tropical Medicine has now been established in connexion with the hospital of the Calcutta Medical College. The foundation stone was laid February 24th by Lord Carmichael, governor of Bengal. The opportunities for research of course will be enormous and a large amount of clinical and pathological material will be available. It is proposed to give a course of instruction of five months' duration in contradistinction to the two or three months course given in the English schools.

# Book Reviews

DISEASES OF THE SKIN, INCLUDING THE ACUTE ERUPTIVE FEVERS. By FRANK CROZER KNOWLES, M.D., Instructor in Dermatology in the University of Pennsylvania; Clinical Professor of Dermatology, Women's Medical College of Pennsylvania; Fellow of the College of Physicians of Philadelphia, etc. Octavo, 546 pages, with 199 engravings and 14 plates. Cloth, $4.00, net. Lea & Febiger, publishers, Philadelphia and New York, 1914.

We can readily agree with the publisher that the most striking feature of this new work is its series of large and clear illustrations, most of which are drawn from the original. The book deals with every eruption of the skin and contiguous mucus membranes, including the exanthemata and the eruptions which occur in the course of the various fevers. The directions for treatment are quite specific and extremely full,—a feature which is not always emphasized in text-books. Dr. Knowles has had a large and varied experience. He has been closely associated with such masters of skin diseases as Duhring, Stelwagon, Van Harlingen, Hartzell, and Davis. He has written an admirable text-book: plain in text and clear in illustration.

LOCAL ANESTHESIA: ITS SCIENTIFIC BASIS AND PRACTICAL USE. By PROFESSOR DR. HEINRICH BRAUN, Obermedizinalrat and Director of the Kgl. Hospital at Zwickau, Germany. Translated and edited by PERCY SHIELDS, M.D., Cincinnati. Octavo, 399 pages, with 215 illustrations in black and colours. Cloth, $4.25, net. Lea & Febiger, Publishers, Philadelphia and New York, 1914.

Within the past two months three books on local anæsthesia have reached us, and of the three this one is the most important—perhaps the most important which has yet been published. It is a translation by Dr. Percy Shields of Dr. Brown's well-known work done from the third edition. The advantage of local anæsthesia as compared with general anæsthesia in its convenience and absence from mortality have long been recognized by surgeons;

but the practice is not so simple as it seems, and there is a wide choice of methods to be employed. The directions in the text-books on surgery are insufficient, and the various monographs lay too much stress upon the method with which they deal. It is in the various specialties, such as ophthalmology, otology, rhinology, gynæcology, and urology, that local anæsthesia has found greatest favour; but the effect of this book will be to enlarge the usefulness of the method. Coming from a German the comparison of the "hard and gruesome Middle Ages" with "the modern world of culture" reads strangely now. Professor Brown says quite truly: "We cannot compare the atrocities of the Middle Ages with our conception of pain." Everything pertinent to the subject is contained in this book, and it comes as a pleasant surprise that some Germans at least are interested in the alleviation of pain.

A Treatise on Diseases of the Nose, Throat and Ear. By William Lincoln Ballenger, M.D., Professor of Laryngology, Rhinology and Otology in the College of Physicians and Surgeons, Chicago. New (4th edition), thoroughly revised. Octavo, 1080 pages, with 536 engravings, mostly original, and 33 plates. Cloth, $5.50 net. Lea & Febiger, Philadelphia and New York, 1914.

During the past six years in successive editions, until now the fourth is reached, Professor Ballenger's treatise on Diseases of the Nose, Throat, and Ear has made its way steadily to the front. In that place it is now finally established. This formidable volume of 1280 pages contains a record of the best practice in the specialty with which it deals. Nothing that is of value in the old or the new teaching is omitted. Upon the labyrinth alone there are over a hundred pages of new matter, and the most modern of the operations are illustrated by twelve diagrams. The occasion of the present revision has been seized to make a searching review of the whole subject. Among other new matters may be mentioned the full description of Mosher's fronto-ethmoid operation, with five drawings, showing each step. Autogenous vaccines in the treatment of hay fever are given place, though this remedy has not fully proved its value. Otosclerosis has been extensively revised. Haynes' operation on the cisterna magna is fully described, and five drawings illustrate the technique. Vaccine therapy has been revised, and the His Leukocyte-extract therapy is given in detail. It forms a valuable advance in the treatment

of certain forms of infectious diseases, especially of the nasal sinuses and meninges. Meningitis has been largely rewritten. The section on Abscess of the Brain has been revised by Dr. Howard Charles Ballenger. The use of salvarsan in the treatment of syphilis of the brain and auditory nerve is described with great fulness and forms an important addition to this edition.

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## Books Received

THE following books have been received and the courtesy of the publishers in sending them is duly acknowledged. Reviews will be made from time to time of books selected from those which have been received.

CHEMISTRY AND TOXICOLOGY FOR NURSES. By PHILIP ASHER, PH.G., M.D. Price $1.25 net. Philadelphia and London: W. B. Saunders Company, 1914. Canadian agents: The J. F. Hartz Company, Limited, Toronto.

A MANUAL OF DISEASES OF THE NOSE, THROAT, AND EAR. By E. B. GLEASON, M.D. Third edition, thoroughly revised. Price $2.50 net. Philadelphia and London: W. B. Saunders Company, 1914. Canadian agents, The J. F. Hartz Company, Limited, Toronto.

ABDOMINAL OPERATIONS, Volumes I. and II. By SIR BERKELEY MOYNIHAN, M.S., F.R.S.C. Third edition, revised; illustrated. Price, cloth, $10.00 net; half morocco, $13.00 net. Philadelphia and London: W. B. Saunders Company, 1914. Canadian agents: The J. F. Hartz Company, Limited, Toronto.

A LABORATORY MANUAL OF QUALITATIVE CHEMICAL ANALYSIS. By A. R. BLISS, JR., M.D., PH. G. Price $2.00 net. Philadelphia and London: W. B. Saunders Company, 1914. Canadian agents: The J. F. Hartz Company, Limited, Toronto.

# Res Judicatæ

## SAVING THE TEETH

MUCH attention has been given of late, and with excellent results, to the question of conservation of natural resources, forests, water powers, etc. It is comparatively easy to arouse interest with resulting action when the possible loss is stated in dollars. But it is a very different problem to arouse interest in health matters and yet the loss here may be comparatively as great. What may be anyone's business is nobody's business. Nothing illustrates this more forcibly than the question of the care of the teeth. How much this means for the health of the individual needs no argument. We are slowly realizing how often conditions of the teeth and mouth (oral sepsis) are responsible for disturbances in the digestive tract and for many disease processes elsewhere, such as arthritis and endocarditis. In almost any locality, but more especially in the rural districts, only slight observation is required to prove how common serious mouth infection is and how few persons have reached adult life with good teeth. I was particularly impressed by this in the Eastern provinces, but in no province or state is there any difficulty in seeing the same thing.

That this should not be is very evident. The problem has been realized and is being met in many of the larger cities by careful attention to the teeth of school children. But this goes but a small way in remedying this evil. It is in the rural districts particularly that reform is needed. How can the problem be attacked to the best advantage? There seem several points which may be considered.

1. Education of the profession. We should lead in any effort to improve public health, but too often we do not. The problem of conservation of teeth and care of the mouth might well be taken up by medical societies with the hope that more might be done than passing resolutions and appointing committees. Those of us who are teachers should not let any student go out lacking a knowledge of the importance of mouth infection. We should investigate the state of the mouth and teeth in every patient and impress the necessity of care on them. For young children the importance of this should be impressed on the parents.

2. Education of the dentist. Surely, you say, they do not require education in anything pertaining to the mouth. But this is just what many of them do require, for the majority are apparently ignorant of the importance of mouth infection and how to treat it. Many of us know how unsatisfactory it is to refer a patient to a dentist for pyorrhœa alveolaris. He often returns with the statement that it is due to too much acid and that nothing much can be done for it. There are some dentists who do their best to educate the public and who devote themselves to this work, but there seems no good reason why everyone who practises dentistry should not be able to do it. There is no desire to disparage the dental profession; we are in the same boat with them in our neglect of this subject. Only a few weeks ago I saw a man in Ontario who had pyorrhœa. He lives in a large town, but there was not a dentist there who could or would treat his condition and he had to make a long journey to Toronto for treatment. Naturally he was not likely to persist in going often enough for good results. There must be something wrong in the teaching. To send out dentists trained in the prophylaxis and treatment of mouth infection would seem much more important to the community than to equip them to cap teeth and make plates, useful as these are. More prophylaxis would result in less need of repair dentistry. In fact the perfection of the technique is often responsible for trouble, as in the case of capped teeth. There is often a process of infection about them and in my experience it is difficult to get the majority of dentists to realize this. In the past week I have seen two cases of arthritis apparently secondary to such a process of infection.

3. Education of the public. Here it is the old story of catching them young. The child who learns to care for the teeth at any rate has some chance of reaching adult life with a clean mouth and good teeth. The school teacher should be instructed how to bring the matter before the children. Such a campaign as this would require the coöperation of the Department of Education in each province. If the provincial medical societies took the matter up seriously it should be possible to bring it before the proper departments. Money would be well spent in supplying dental supervision to all schools. There is a story going the rounds of an Englishman who wished to enlist, but was rejected on account of bad teeth. He remarked that his object was to shoot the enemy and not to bite them. He did not realize that soldiers with bad teeth would be more likely to be ill and less efficient in the field than those who could chew any kind of food.

Improvement requires both concerted and individual effort. Education for both the profession and public is necessary. There should be a large field for the dentist who is willing to devote himself particularly to what may be termed prophylactic dentistry. The medical profession should be eager to realize such effort and support it by referring patients to such a man.

Fortunately there are simple measures which we can adopt and which are often of considerable benefit. The first essential in treating mouth infection is to ensure proper brushing of the teeth and gums with a suitable toothbrush. With this the use of floss silk between the teeth is advisable. After this a saturated solution of sodium silicofluoride or one per cent. hydrogen peroxide can be used as a mouth wash. The local application of tincture of iodine to the infected areas is of undoubted value. The use of these can be taught to any patient. The proper methods of brushing the teeth and using the silk require demonstration. Hospitals can help by teaching mouth hygiene to every patient who enters a public ward. Some of them will profit by the lesson.

T. McC.

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A VERY satisfactory report on the health of the city of Saskatoon has been furnished by Dr. Wilson, the medical health officer. During the first ten months of 1914, the birth rate increased from 30 to 33·56 per thousand, and the death rate fell from 14·82 to 10·20 per thousand. The number of cases of infectious disease was materially less than in 1913, and whereas in 1913, 145 deaths occurred amongst infants only 87 were reported during the period under consideration. Twenty-four cases of typhoid were reported, two of which were fatal, whereas in 1913, 51 cases and 11 deaths occurred. Diphtheria is an exception, the cases reported numbering 44 as compared with 19 in 1913. The increase, to some extent, is attributed to the change in the regulations concerning the notification of this disease.

## Obituary

Dr. Edward Rolston Langrill, of Toronto, died October 13th, at the age of thirty-nine. Dr. Langrill had been in poor health for some time. He was a graduate of Trinity University, receiving the degree of M.D. in 1900.

Dr. Susan Grace Dougall, of Montreal, died December 5th, in the sixty-third year of her age. After studying medicine at Edinburgh University, Dr. Dougall practised in Philadelphia and New York; for the past seven or eight years she had resided in England. Dr. Dougall took an active part in many philanthropic and charitable works.

Dr. W. L. Gaboury, of Pembroke, Ontario, was killed instantly while driving across a railroad track.

Dr. Solomon Singer, of Toronto, died October 19th, in the thirty-eighth year of his age. Dr. Singer was educated in the public school of Toronto and at the Harbord Collegiate Institute; he graduated from the University of Toronto in 1903 and the following year received the degree of M.D. He then did some post-graduate work in the New York hospitals and returning to Toronto, commenced to practise there. Dr. Singer leaves a widow and two children.

Dr. John Closson Ray, of Toronto, died October 17th. He received the degree of M.D. from Victoria University in 1862.

Dr. Calvin Shaw, of Cleveland, Ohio, died October 12th. Dr. Shaw formerly resided in Toronto; he graduated from Trinity University in 1895.

Dr. Frederick Frank, of Orangeville, Ontario, died November 25th, in the seventy-fifth year of his age. Dr. Frank was born in the township of Caledon; he had resided at Orangeville for more than forty-five years. He leaves a widow, one son, and one daughter.

Dr. H. Martel, of East Angus, Quebec, died suddenly

November 23rd. Dr. Martel was twenty-eight years of age and had been in practice at East Angus for some years. He leaves a widow, four sons, and one daughter.

Dr. A. M. Rosebrugh, of Toronto, died November 26th, in the eightieth year of his age. Dr. Rosebrugh was born at Branchton, near Galt, in 1835. He graduated from Victoria University. In 1863, the free dispensary in Toronto was re-opened, largely through the efforts of Dr. Rosebrugh; he organized the Toronto Eye and Ear Infirmary, and was a member of the Prison Reform Commission of 1890. When he first began to practise, Dr. Rosebrugh's interests were chiefly centred in ophthalmology and medical electricity; later he devoted a large portion of his time to reform work of various kinds and the care of the feeble-minded. His widow, four daughters, and three sons survive him.

Dr. Nathaniel Osborne Walker died at Woodhouse, Ontario, on November 25th. Dr. Walker was born at Woodhouse in 1832; he was educated at Upper Canada College, afterwards entering the University of Toronto where he received the degrees of B.A., M.B., M.A., and M.D., the latter in 1859. Dr. Walker then studied in England and became a member of the Royal College of Surgeons. On his return to Ontario, Dr. Walker went into practice at Vittoria and, in two years' time, removed to Port Dover. About thirteen years ago he went to Los Angeles and there practised for three years, when failing health compelled him to relinquish his professional work. At the time of the Northwest Rebellion, Dr. Walker was in charge of a base hospital. He is survived by four sons and three daughters.

Dr. Kempshall, of Ingersoll, Ontario, died December 3rd, at the age of eighty-seven years.

Dr. Hillier Noel Coutlee, of Sharbot Lake, Ontario, died at the Kingston General Hospital, December 8th, in the fifty-eighth year of his age. Dr. Coutlee was born in Ottawa, and in 1881, graduated from Queen's Medical College.

Dr. M. D. Sudworth, of Ingersoll, Ontario, was found dead near Guelph on December 3rd. Dr. Sudworth had been at Blind River for several months assisting another young doctor there; he graduated only last year and was about twenty-five years of age.

Dr. William Higginbotham, of Brantford, Ontario, died December 15th, in the sixty-seventh year of his age. A graduate of Queen's University, Dr. Higginbotham first went into practice at Omemee whence he removed to Brantford.

Dr. Llewellyn Brock, of Guelph, Ontario, died December 11th. Dr. Brock was born in Guelph and graduated in medicine from Toronto University. He then returned to his native city where he practised for many years.

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# News

## MARITIME PROVINCES

Scarlet fever has been prevalent for some months past in certain communities in Cape Breton County. The disease has assumed a very severe form and in several cases has terminated fatally.

The St. John County Hospital for Tuberculosis at Little River, New Brunswick, is almost completed. It consists of a main building and two wings.

Dr. T. A. B. Addy, of St. John, New Brunswick, has been elected a Fellow of the American College of Physicians and Surgeons.

## ONTARIO

One hundred and fifty cases of diphtheria were reported in Berlin during the twelve months ending October 31st, 1914. Nineteen deaths occurred,—that is a case mortality of 12·6 per cent., or 10 per cent. per thousand of population. The disease has been unusually prevalent in various parts of the province during the past few months.

Dr. G. L. McDougal has been appointed medical officer of health of Harriston, in succession to the late Dr. H. R. McCullough.

An epidemic of measles is reported from Goderich. Under

date December 12th, it was reported in the daily press that the schools and churches were closed and that there were in the town at least seven hundred cases of the disease.

THE two cottages which have been added to the Mowat Memorial Hospital, Kingston, are now completed. They were built with the proceeds of a legacy left by the late Mrs. Nicol.

DURING the year ending October 31st, 1914, 137 deaths from tuberculosis were reported in Ottawa, whereas but 107 cases of the disease had been reported by physicians. In common with other parts of Canada, diphtheria has been unusually prevalent in Ottawa, there having been reported 614 cases and 60 deaths. One hundred and nineteen cases of typhoid and 13 deaths, and 45 cases of small-pox were reported. During the early part of the year scarlet fever of a severe type was prevalent; the number of reported cases throughout the year was 344 and 29 deaths.

THE new wing of St. Luke's Hospital, Ottawa, was formally opened on Tuesday, December 8th, by Their Royal Highnesses the Duke and Duchess of Connaught. The building was given by Mr. J. B. Booth; the furnishings of the men's wards were given by Mrs. L. B. Seybold, and those for the women's wards by Mr. and Mrs. John Lumsden. Each ward contains twenty beds.

DR. W. E. STRUTHERS, of the Toronto department of education, has been appointed chief medical officer of the Workmen's Compensation Commission. The Compensation Act came into force at the beginning of this month.

DR. ALEXANDER MCKAY has been appointed chief medical officer of the public schools of Toronto, in succession to Dr. W. E. Struthers.

A BUST of the late Dr. Emily Stowe was presented to the city of Toronto on October 29th, having been subscribed to by friends of Miss Stowe, the first woman to practise medicine in the province of Ontario.

DURING the week ending December 5th, sixty-seven cases of chicken-pox were reported in Hamilton.

## QUEBEC

THE governors of the Montreal General Hospital have guaranteed an amount sufficient to enable the hospital to continue its work for the next three years. The Notre Dame and Western hospitals will also be kept open, at least for some time to come, notwithstanding the present financial stringency.

## SASKATCHEWAN

THE new wing of the Regina General Hospital is now ready for occupation. No formal opening will take place, but the accommodation will be used as required. The wing is four storeys high and each storey is provided with balconies. For some time past the older portions of the hospital have been overcrowded and the extra accommodation will be very helpful.

## BRITISH COLUMBIA

A WING has been added to the Chilliwack Hospital. The new addition consists of two storeys and measures twenty-five by forty-five feet. The accommodation of the hospital has been almost doubled.

IT is announced that Dr. Arthur G. Price, of Cowichan Station, near Duncan, has been appointed medical officer of health for South Cowichan, to succeed Dr. Watson Dykes.

## MEDICAL COLLEGES

*Manitoba University.*

THE Faculty of the Manitoba Medical College has decided to raise the standard of the medical matriculation examination. Beginning with the session 1915-1916, all students must have standing equivalent to that of the first year in the science course in Manitoba University. Medical matriculation in Manitoba, therefore, now consists of a junior matriculation, divided into part 1 and part 2, really the same as the old junior and senior matriculation, and a senior matriculation which is the same as the first year science examination. This step probably will be followed in a few years by another that will again raise the standard.

The total number of students in medicine enrolled for the session 1914-1915 is one hundred and seventy-six. The freshman class numbers forty, including four women.

The following are the additions and changes to the staff of the Manitoba Medical College: Dr. W. L. Watt has been appointed lecturer in roentgen rays and electrotherapeutics; Dr. Boyd professor of pathology; Dr. R. D. Fletcher lecturer in genito-urinary diseases; Dr. Hugh Mackay lecturer in dermatology; Dr. T. Herbert Bell lecturer in clinical ophthalmology; Dr. G. W. Fletcher lecturer in clinical otology and laryngology; Dr. D. S. Mackay lecturer in clinical gynæcology; Dr. J. D. McQueen lecturer in materia medica and pharmacy; Dr. A. T. Mathers lecturer on contagious diseases; and Dr. J. A. Gorrell demonstrator in anatomy. Dr. J. O. Todd has been appointed lecturer in theoretical surgery in place of Dr. B. J. Brandson who has resigned, and Dr. E. S. Moorhead has been appointed lecturer in theoretical medicine to succeed Dr. W. Chesnut, resigned.

The war has called away a number both from teaching staff and students. Among those who have joined the Army Medical Corps of the first and second contingent of the Overseas Expeditionary forces are Dr. W. L. Watt, Dr. F. C. Bell, Dr. T. H. Bell, Dr. W. Webster, and Professor Boyd. Dr. George W. Treleaven, one of last year's graduates, will accompany the second contingent as an officer in the Sixteenth Field Ambulance.

*McGill University.*

THE offer made by the medical faculty of McGill University to supply the personnel of a general hospital has been accepted by the War Office and by the Canadian Department of Militia.

*Dalhousie University*

THE appointment is announced of A. G. Nicholls, M.A., M.D., D.Sc., F.R.S.C., to the chair of pathology and bacteriology at Dalhousie. Dr. Nicholls was assistant professor of pathology at McGill University. Dr. Nicholls was born in Durham, England. He studied at McGill University and graduated in medicine in 1894.

## ARMY MEDICAL SERVICES

DR. R. A. HUGHES, of Swift Current, Saskatchewan, has been appointed lieutenant in the Imperial Royal Army Medical Corps and has left for England.

DR. W. E. HOME, of Victoria, has offered his services to the British Admiralty and has left for England.

Dr. J. A. Montgomery, of Deloraine, Manitoba, has joined the British Red Cross with a view to active service. The degree of L.R.C.P. and S. was recently conferred upon Dr. Montgomery.

No. 2 Stationary Hospital, which accompanied the first Canadian contingent, has been established at Le Touquet, near Boulogne. The hospital is in charge of Lieutenant-Colonel Shillington and included in the personnel are Drs. Scott, Quebec; Rudolph and Goldsmith, Toronto; Dillon and McLeod, Ottawa; McKay, Montreal; Cockburn, Sturgeon Falls; Wilson, London; Alwyn Smith, Winnipeg; Tyler and Bethune, Hamilton, and Philip, Cahon, and Menzies.

No. 6. Field Ambulance, C.E.F., which has been recruited from the fourth military division, is now in barracks at Montreal, preparatory to accompanying the second contingent. The officers are: Majors Phillip Burnett, and T. J. Murphy, P.A.M.C., Captain W. Howell, Lieutenants Andrew Macphail, R. H. M. Hardisty, G. Ross, H. P. Wright, and Walter. It is expected that Major R. P. Campbell, who is at present with the general hospital at Salisbury, will take command of this unit on its arrival in England.

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## Canadian Literature

### Original Contributions

*The Canadian Journal of Medicine and Surgery*, December, 1914:

A fatal case of rabies in a child . . . J. G. Fitzgerald.

*The Western Medical News*, December, 1914:

Infant feeding . . . . . J. W. Turnbull.

*The Public Health Journal*, December, 1914:

The use of the fermentation test in milk examination . . . . . J. Race.

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| Medical inspection of schools in Edmonton | T. H. Whitelaw. |
| How can the average old stable be most cheaply fitted for the production of clean milk | J. B. Hollingsworth. |
| Nerve block, public health and tuberculosis | Sir J. Grant. |
| Principles of criminal anthropology | A. McDonald. |
| Light and ventilation as factors in public health | T. Watson. |

*La Clinique*, December, 1914:

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| Traitement du cancer de la prostate | F. de Martigny. |

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# Medical Societies

## CANADIAN MEDICAL ASSOCIATION

### Vancouver Meeting, 1915

The annual meeting of the Canadian Medical Association for 1915, is to be held in Vancouver on July 6th, 7th, 8th and 9th, with Dr. R. E. McKechnie as president-elect. This western fixture coincides very happily with the Panama Pacific Exposition and also with the meeting of the American Medical Association in San Francisco in June 21st, 22nd, 23rd, 24th, 25th.

Arrangements are being made with the transportation companies for special rates for our members to include the San Francisco Exposition, so that pleasure and profitable entertainment can in this way be included in a trip to the West.

To those who have not been in British Columbia before, the Rocky Mountain trip is in itself worth all the cost, while in addition will be included the beautiful coast scenery, and the delightful summer weather, for which Vancouver is so justly famed. The phœnix-like growth of San Francisco will come as a marvellous surprise to those who knew this lovely city before the fire, and who mourned its loss, and who imagined that even the indomitable Western spirit could never attempt to rebuild on the old site. This same Western spirit, Canadian this time and not American, is

rising now to make the Vancouver meeting a record one. Undaunted by bad times and war times, the medical fraternity in Vancouver are working hard, getting things in shape for the coming meeting, and can promise in advance, that none will find it a waste of time to go so far.

Apropos of war, a special feature of the programme will be the subject of military surgery, and while the Canadian military surgeons will be for the most part on active service, it is hoped that some of our American neighbours and *confreres* will give us some experiences in this line, which will be useful to those who are only waiting for their chance to serve their country.

The various sectional committees are in able hands and already many promises of papers have been obtained, but as yet it is too early to present a provisional programme. This will be given shortly, and in the meantime everyone should make up his mind to attend, to work towards that end and to remember that no meeting can be a success without outside attendance.

The committees would deem it a favour if those who are coming and are willing to present papers would notify the local secretary, Dr. Frederic Brodie, Birk's Building, Vancouver.

THE COMMITTEE OF ARRANGEMENTS consists of the following doctors:

Chairman: W. D. Brydone-Jack.

Secretary: Dr. Frederic Brodie.

Executive: R. E. McKechnie, I. Glen Campbell, W. F. Coy, J. M. Pearson, Wm. C. McKechnie.

Together with the following sub-committees, the first name in each case being that of the chairman, and the second that of the secretary, of the respective sub-committees:

Finance: P. A. McLennan, A. S. Monro.

Reception: O. Weld, W. D. Keith.

Transportation and Publicity: A. P. Proctor, A. B. Gordon.

Accommodation: F. P. Patterson, J. A. MacDonald.

Exhibits: M. T. McEachern, G. H. Worthington.

Entertainment: E. D. Carder, T. R. B. Nelles.

Credentials and Registration: J. M. Pearson, G. H. Clement.

Medicine: J. W. McIntosh, A. R. Robertson.

Surgery: A. S. Monro, H. W. Riggs.

Obstetrics and Gynecology: W. B. Burnett, C. F. Covernton.

Eye, Ear, Nose and Throat: I. Glen Campbell, J. C. Farish.

Public Health: C. S. McKee, A. Cumming.

*X*-rays: H. H. McIntosh, G. E. Richards.

Military Surgery: F. C. McTavish, Stanley Paulin.
Pediatrics and Orthopedics: W. S. Verrall, W. A. Clarke.
Printing: J. H. McDermott, W. F. Mackay.

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## ONTARIO MEDICAL ASSOCIATION

It has been decided that the meeting of the Ontario Medical Association will be held in Peterboro on May 25th, 26th, 27th and 28th next, and that the Provincial Health Officers' Association, under the presidency of Dr. Hall, of Chatham, will hold its meeting in Peterboro also during the same week. The joint meetings of the two Associations will secure a very large attendance of the profession throughout the province, and will probably result in single fares being obtained for the delegates.

The accommodation for these meetings will be unusually good, as the Committee of Arrangements has succeeded in obtaining the use of several large halls, as well as of the Armouries, all of which lie side by side, and are but a short distance from the hotels.

The Committee on Papers and Business, under the direction of Drs. H. J. Hamilton of Toronto, and G. S. Cameron of Peterboro, has already had several meetings, and the programme is in an advanced state. It is expected that about ten papers will be read in each of the main sections, and the names of readers already secured ensure a programme of great interest.

On the evening of the first day there will be a public welcome, given by the City of Peterboro, and a public address on some health topic will follow. The President's address will be delivered the evening of the second day.

Members of the Associations desiring to read papers should communicate at once with Dr. Mann of Peterboro, or Dr. Strathy of Toronto, forwarding the titles of the papers which they desire to read. The committee has decided that no papers will be presented unless an abstract thereof be placed in the hands of the committee before the first of March.

At the meeting of the committee to arrange the programme of the section of medicine for the meeting of the Ontario Medical Association it was decided,

1. That the first meeting of the section take the form of a symposium, the subject being Diseases of the Heart.

2. That at each of the other two meetings of the section five papers be read. Papers to be read by invitation. (Ten representative men have been asked to give papers.)

3. That any member having a paper that he wishes to present to the section may send the paper to the Committee for their approval. If accepted it will be added to the programme.

4. The subject of all papers must be in the Secretary's hands by January 1st and a synopsis of the paper by March 16th. If these rules are not complied with the paper will be dropped from the programme.

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## ACADEMY OF MEDICINE, TORONTO

### Proceedings of the Section of Medicine

For the regular meeting of the Section of Medicine a symposium on headaches associated with various diseases had been arranged by the programme committee. The headaches associated with deranged metabolism were dealt with by Dr. W. J. Wilson, while Dr. Colin Campbell had been chosen to speak on those due to diseases of the eye, Dr. Gilbert Royce on those due to diseases of the ear, nose and throat, and Dr. Julian Loudon on those due to diseases of the central nervous system. Dr. George W. Ross confined his remarks to the special subjects of hemicrania, tic-douloureux and lymphorrhagia. In addition to this symposium, Dr. J. H. McPhedran presented a very interesting case of lymphatic leukæmia. The following is an extract of the remarks of these speakers and of the discussion which followed.

Lymphatic Leuaekmia: The case presented was a Macedonian, male, age nineteen, single, sausage maker. He was at the time an in-patient at St. Michael's Hospital to which he had been admitted on the recommendation of Dr. J. M. McCormack, on October 22nd, 1914. The history of the present illness was that he had not been feeling well for six weeks before admission. For one month before admission he had been suffering from thirst and loss of appetite. Two weeks before admission he began to be troubled with night sweats and immediately before that he had pain in the right hypochondrium and was unable to sleep. There was nothing of importance in the previous history, the family history, or the habits. He denied the possibility of venereal infection. On examination all the superficial lymphatic glands were found to be slightly enlarged and in many places were matted together. There was a large very hard mass in the right hypochondrium which extended from beneath the costal margin and reached to the middle line of the abdomen and to the level of the umbilicus. This mass moved slightly on respiration, and could be grasped between the

hands when one hand was placed in the right loin and the other in the right hypochondrium or right side of the epigastric region. On looking at the chest an impulse could be seen in the fifth right interspace immediately inside the right nipple line. On percussion no cardiac dulness could be obtained on the left side, while an area corresponding to a transposed heart could be mapped out on the right side. The edge of what was evidently an enlarged and transposed liver could be felt beneath the costal margin of the left side. The conclusion was that the large hard mass in the right upper quadrant of the abdomen was an enlarged spleen. The *x*-ray plates showed the complete transposition of the viscera. To confirm this conclusion Dr. Loudon had been asked to take electrocardiograms,—the most positive signs we possess for diagnosing transposition of the heart. In the first lead from the two arms all the summits of the electrical waves were invested. This was so because the first lead was a symmetric one and the left arm of the abnormal subject stood in the same relation to the heart as the right arm in the normal subject. In the second lead from the right arm and left leg and in the third lead from the left arm and left leg, all the summits were the same as in the normal subject; but it should be remembered that the second lead corresponded to the third lead of the normal subject while the third lead corresponded to the second lead. Dr. McPhedran then proceeded to describe the blood picture. On October 24th, r.b.c. were 4,200,000 and w.b.c. 5,300. On October 26th, r.b.c. were 4,200,000, hæmoglobin 58 per cent. and w.b.c. 8,400. The differential white count showed polymorphonuclears 1 per cent., lymphocytes (almost all large) 97 per cent. and eosinophiles 2 per cent. On November 3rd, w.b.c. were 204,000. On November 4th, w.b.c. were 274,000 and r.b.c. 3,728,000. On November 8th, w.b.c. were 326,000 and on November 10th, 276,000. Just before the case was presented the w.b.c. were the same in number as on November 3rd. On October 28th, the Wassermann reaction was positive. The urine has been normal throughout. The temperature has been intermittent with an evening rise to 100° or 101°. On October 23rd, he was given potassium iodide three times a day. This was substituted by five minims of liquor arsenicalis three times a day on October 31st. On November 3rd, the liquor arsenicalis was discontinued, and ten minims of benzol three times a day was prescribed.

HEADACHES DUE TO DERANGED METABOLISM: Dr. W. J. Wilson spoke of headaches due to such conditions as anæmia, fevers, constipation, uræmia, and other toxic conditions. He stated

that in a general way frontal headaches were dyspeptic, toxic, or malarial in origin. Occipital headaches were often due to constipation and caries of the lower molar teeth. Anæmic headaches affected the vertex and were due to neuralgia and caries of the upper teeth. If bilateral, the temporal headaches were likely to be found to have a toxic origin. The treatment of these classes of headaches was then reviewed.

HEADACHES DUE TO DISEASES OF THE EYE: In endeavoring to decide whether or not the headache was due to eye trouble Dr. Campbell said he attached a good deal of importance to the patient's story. He asked such questions as the following: "Is the vision good and comfortable?" "Is the distant vision good?" "Is the near vision good?" "How long have the headaches been troublesome?" "How often do the headaches occur?" One must be careful in elderly people not to mistake the temporal pain and vomiting of glaucoma for migraine. Pain due to efforts of accommodation or astigmatism was usually frontal or at the back of the eyes or through the temples. Anomalies of the ocular muscles were prone to cause pain in the occiput or down the spine. In speaking of refraction, Dr. Campbell said that it was impossible to determine the refraction of a child without the use of a mydriatic. The same may be said of all neuropathic patients under the age of twenty-five.

HEADACHES DUE TO DISEASES OF THE EAR, NOSE, AND THROAT: Dr. Gilbert Royce said that headache was perhaps the commonest symptom associated with diseases of the ear, nose and throat. Yet it was most elusive and was the least understood of all signs pointing to trouble in these regions. He emphasized the importance of the general practitioner being able to make a careful and thorough examination of these regions, so that he might recognise any abnormalities. Headache in these regions was mostly due to involvement of the branches of the fifth cranial nerve which supplies the mucous membrane in the various passages and sinuses. As a diagnostic symptom in connexion with nasal or sinus trouble, head pains were chiefly of value when taken along with other symptoms. Numerous diseases were then mentioned in more detail and the appropriate methods of treatment were described.

HEADACHES DUE TO DISEASES OF THE CENTRAL NERVOUS SYSTEM: Dr. Julian Loudon said that if headaches due to particular disease always exhibited the same characters and were always located in the same regions, we would possess in them one of the most invaluable symptoms from a diagnostic point of view. Un-

fortunately, there was nothing in the character or location of the headaches which surely distinguished the underlying disease. In consequence it was necessary to look for other signs and symptoms before one could feel sure of the diagnosis. Dr. Loudon then outlined a plan for the systematic examination of patients suffering from headaches. In regard to the causes of headaches, it was stated that all the causes acted by irritating the sensory nerves of the meninges or structures external to these. The brain itself was insensitive and extensive disease in it might exist without any pain, except the physical pain of mental misery. The commonest headache was said to be the neurasthenic type. This was constrictive, pressing or squeezing. It was worst in the morning and might have disappeared at night. The hysterical type was commonly vertical and was usually sharp and boring. The next class mentioned was the form due to tertiary syphilis. This was an early, common and almost constant symptom. It was worse at night and often very severe. In those cases in which it was due to arterial disease, it was important to remember that it might be a premonitory symptom of cerebral thrombosis. The headache of cerebral meningitis was a very significant and almost constant symptom, and was due to meningeal inflammation as well as to a general rise in intracranial pressure. The headaches due to cerebral tumours usually came on early and were due to a general rise in intracranial pressure. They often had great exacerbations which occurred either at night or in the daytime. Cerebral abscesses caused the same type of headache and were often not accompanied by a rise of temperature. The treatment was then outlined and several cases were quoted.

HEMICRANIA, TIC-DOLOUREUX, AND LYMPHORRHAGIA: Dr. George W. Ross briefly outlined the supposed causes of hemicrania, tic-doloureux, and lymphorrhagia. He defined lymphorrhagia as a blood state where the lymph escaped too readily into the surrounding tissues and caused a flooding of the lymph channels with fluid. Water-logging of the tissues ensued and with it a number of symptoms and signs. In regard to treatment of these conditions Dr. Ross stated that the majority of patients suffering from tic-doloureux could be quickly and easily relieved by intraneural injections of alcohol. When it was necessary to inject the larger branches of the fifth nerve the procedure should be left to one who had a special knowledge of the necessary technique. The method used, the results obtained, and the chemical action of the alcohol were then explained. In hemicrania, a case recalled

where calcium therapy seemed to have helped. In another case complete relief was obtained after appendicectomy. It seemed possible that a chronic focus of infection might be found to play a part in the causation of this disease. In some cases Dr. Ross had controlled the attacks by injecting 1·5 cc. of novocain into the focus of the pain. In lymphorrhagia, all substances which lowered the coagulability of the blood were forbidden. Cow's milk was beneficial on account of the lime contained in it. Calcium lactate was administered three times a day for several weeks.

Discussion: Dr. Paul Scott thought that the refraction should always be tested in cases of persistent headache. If headache were a recent development in a patient over fifty years of age, it was not usually due to errors in refraction. In some cases there might be several causes, and, while it might be found that the correction of the error of refraction might somewhat relieve the headache, it might also be found that it had not brought about a complete cure.

Dr. G. Sterling Ryerson concurred in Dr. Scott's remarks, and stated that a common cause of headaches not mentioned was a very small degree of myopic astigmatism.

Dr. Donald McGillivray asked why Dr. Ross prescribed caffeine with coal tar products for headache, and also if calcium lactate were not of less use than was often supposed.

Dr. Graham Chambers spoke of subjective headaches and said that cases which once suffered from nervous states might recall these states without apparent reason. He had seen and heard of cases in which the headache could not be explained on any other basis. He also stated that he had tried calcium lactate in so-called cases of lymphorrhagia without benefit and did not believe that the calcium salts necessarily increased the coagulability of the blood. He said it was rare to get other symptoms of this disease, such as chilblains and urticaria, accompanied by headache.

Dr. R. A. Reeve said he had noticed a gratifying change of attitude in general practitioners in regard to headaches. Patients then had more confidence in the family physician. Some were still suspicious of specialists as faddists. He was gratified to see the increased attention being paid to diseases of the eye, and said that everyone should be able to detect hypermetropia and correct it. All that was required were a few convex and weak cylindrical lenses. If there should be nominal visual acuity with a convex glass, the patient must have hypermetropia, as the normal eye cannot see so well with convex glasses as without them.

Dr. H. B. Anderson said that he had been much interested in

the papers, but that they covered such a wide field that it was impossible to discuss them fully in one evening. One headache of which Dr. Wilson had spoken was the anæmic type. Dr. Loudon had mentioned a similar type with a sense of constriction, worse in the morning and often associated with neurasthenic symptoms. Dr. Ross mentioned a type worse in the morning which he called lymphorrhagia. Dr. Anderson thought that all these types were likely the same and that they were neurasthenic. The neurasthenic type was the commonest type of all headaches, and the anæmia which so frequently accompanied the headaches was another symptom of neurasthenia. He said that he had tried calcium lactate in what looked like suitable cases, but had not much success. He suggested that he had not used the drug with such a degree of assurance as Dr. Ross, and therefore had not produced such a good mental effect. In regard to migraine, Dr. Anderson thought that the most important part of the treatment was that carried out in the interval between the attacks. One must try to find an underlying cause. There may often be an autointoxication. It may be necessary to treat the digestion and regulate the bowels. Tonic treatment and the correction of errors of refraction may be indicated.

Dr. Trebilcock thought that pressure in the upper air passages such as the frontal sinuses was an extremely common cause of headache. He also said that there was a large series of cases in which the headache was said to be due to errors of refraction when it was in reality due to late hours and irregular meals. An example of this class were the young women stenographers, who were often led to believe thay were suffering from errors of refraction when such was not the case.

Dr. Ross, in replying to the discussion of his paper, said that it was necessary to keep a level head when considering new ideas such as lymphorrhagia. He would be delighted to admit that he was wrong in regard to lymphorrhagia, if a series of experiments, similar to those carried out by himself, showed that he had misinterpreted the results. In the treatment of this condition he said that the administration of calcium lactate was of no use unless a suitable diet was prescribed.

The meeting then adjourned.

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## MONTREAL MEDICO-CHIRURGICAL SOCIETY.

THE seventeenth regular meeting of the Society was held Friday evening, June 5th, 1914, Dr. D. F. Gurd, president, in the chair.

PATHOLOGICAL SPECIMENS: Series by Dr. L. J. Rhea.

1. Peyer's patches from a case of typhoid fever, early stage.

2. Mesenteric lymph nodes from same case, with suppuration; pure cultures of typhoid bacilli obtained.

3. Kidneys and ureters showing tuberculosis, one kidney shows an old lesion, the other a recent one.

4. Horse-shoe kidney.

CASE REPORTS: 1. Failure to close abdominal wall, by Drs. K. Cameron and L. J. Rhea.

Dr. Cameron: The baby was born at eight months, the whole of the intestinal tract was outside the body through an opening about two inches to the right of the umbilicus. I opened up the whole extent of the abdominal wall and made an effort to get this intestinal tract within the wall but failed to do so; there was no attachment of the viscera to the spinal column. Dr. Rhea reports that there is no congenital malformation of the intestinal tract beyond the fact that it was swollen, though it seemed to me that the small intestine was much smaller than usual; it was patent.

Dr. Rhea: I believe these defects are explained upon embryological bases; the cleavage line in front either is not closed or it is very thin and ruptures.

DISCUSSION: Dr. Bazin: It seems to me this is simply a worse condition than the one Dr. Powell reported at the last meeting. I should like to ask Dr. Cameron if the defect were present only in the abdominal wall or if it extended into the thorax. There is a longitudinal fissure in the sternum which sometimes persists and that may extend through to the surface, and not only may one get protrusion of the abdominal contents but also of the thoracic. These cases never develop with the intestines outside the body; it is the bursting of the membrana reuniens, either just prior to birth or at the time of birth, that delivers the abdominal organs just outside the cavity.

Dr. Cameron: The only defect present was the opening in the abdominal wall:

2. Note on the thyro-glossal duct, by Drs. G. Ross and T. A. Malloch. Patient developed a rapidly growing swelling about 4 cm. above the supraclavicular notch with pain and stiffness in the neck. At first firm, the size of a cherry, then soft and fluctuating. There was a small opening about the size of a pin-head on the surface of the mass which patient said had always been there. Incised by Dr. Garrow.

Discussion: Dr. L. J. Rhea: One case I saw was in a little girl of six years; the cord-like character was very evident. It was very hard like an arterio-sclerotic vessel, and I was unable to demonstrate the type of epithelium on account of the fact that it was infected.

Dr. Guy Johnson: I would like to ask if this mass moved up and down on swallowing, as I have seen four or five of these and in every case the cyst was seen moving up and down on swallowing.

Dr. G. Ross: It was noted that the mass moved up and down on swallowing.

3. Hour-glass stomach, illustrated by skiagrams, Dr. A. Bazin and Dr. L. J. Rhea.

We wish to bring to your attention to-night two cases of hour-glass stomach, the study of which will, I think, well repay the time spent. These cases illustrate two distinct types in regard to (a) symptoms, (b) operative findings, and (c) operative treatment.

Case 1. In February, 1909, A. H., female, aged thirty-seven, married, nulliparous, complained that for a year previous had severe continuous indigestion characterised by poor appetite, flatulence, and weighty feeling after meals; no pain but great distress relieved by vomiting. Vomiting usually constant after every meal; occasionally a meal or two retained but later a much larger quantity vomited (gastrectasis). Vomitus consists of ingested food, much fermented, no blood. Emaciation is extreme, weight from 153 to 105 lbs. Had always had "indigestion"; at age of fourteen had pain after eating and a "tender sore stomach". "Peritonitis" at eleven, cause unknown. Menstrual distress, irregularity, periods of amenorrhœa frequent varying from a few months to nineteen months. Hæmorrhoids removed in 1905.

Examination: Epigastric distension, more marked to left of mid line, visible peristalsis from left to right, very sluggish. Amphoric note of stomach has seven inches vertical diameter extending two inch below umbilicus and right border of amphoric note is vertical and broad, not narrowing off to the pyloric region. Vomiting caused epigastric distension to disappear. Both kidneys freely movable, the right down to pelvic brim (true), the left allows of upper pole to be grasped. The hypogastrium is prominent and inflated colon shows that it occupies this portion of the abdomen. Test meal gives large quantity, total acidity 70, no HCl, lactic acid plus, no rennet or pepsin digestion, no blood. These findings pointed to an atonic dilatation of the

stomach associated with a splanchnoptosis. Lavage was commenced and the patient easily learned to carry this out for herself. Occasionally during this period of treatment it was noticed that soiling of the wash water would occur in the manner indicative of hour-glass stomach but both general and local improvement was marked for a couple of months. Subsequently, however, there was relapse in spite of continued lavage. The test meal resulted in similiar findings, viz.: no HCl, no pepsin or rennet digestion; lactic acid, however, was absent.

Operation July 3rd, 1909: Small hard scar on lesser curvature, five inches from pylorus and encircling the stomach which was typically hour-glass in shape. The lumen of the constriction would not admit the tip of the little finger; the cardiac pouch was large and thick walled, the pyloric pouch large and thin walled. The opposing borders of the two pouches lay together and overlapped, thus explaining the inability to work out by percussion anything but the outline of a largely dilated stomach. The pyloric ring was attenuated and greatly distended, as was also the duodenum as far as the superior mesenteric vessels when the intestine suddenly became contracted.

This I regard as a form of chronic or slowly forming arteriomesentric ileus caused by the distended and heavily loaded cardiac pouch pressing downward upon the root of the mesentery and thus gradually tightening the superior mesenteric vessels across the third part of the duodenum with partial obstruction of the same. Without this explanation (obstruction) one would expect the cardiac pouch and duodenum, in fact all portions of the intestinal tract distal to the hour-glass constriction, to be empty and contracted. There were no glands to be seen or felt and no adhesions present. The original ulcer seemed to be quite healed and quiescent. A gastro-gastrostomy was done by a horseshoe incision (modified from Finney's gastro-duodenostomy), giving a lumen which easily admitted the whole hand. Convalescence was uneventful. In three months she weighed 143 lbs., eating heartily. There was some flatulence but no vomiting. September, 1910: Test meal shows free HCl, pepsin and rennet digestion; splanchnoptosis has disappeared; inflated stomach is above the level of the umbilicus. I saw her to-day, June 4th, 1914 (five years after operation); she has trained as a nurse and follows her profession without difficulty, eats heartily, no indigestion and weighs 155 lbs.

Case 2. M. C., female aged thirty-one years, married, nulliparous. Admitted to Montreal General Hospital April 23rd, 1914, referred by Dr. F. Tees. Complaints: acute stomach

distress with pain and vomiting for two weeks, hæmatemesis preceding day. Since age of fourteen has suffered from attacks of pain and vomiting with intervals of health; has been treated for gastric ulcer.

Examination: Fairly well nourished; tongue thickly furred, breath foul. Abdomen normal in contour, diffuse tenderness over upper abdomen and right inguinal region; complains of pain upon turning in bed; no occult blood in stool. Put on Leuhartz diet with enema of saline with glucose five per cent. Stomach very irritable, vomits frequently, nausea constant requiring discontinuance of Leuhartz for a few days. Gradual improvement and barium meal with *x*-ray done May 6th. This showed an hour-glass condition and operation was performed May 15th.

Five inches from pylorus along lesser curvature was situated a mass of indurated stomach wall and gastro-hepatic omentum, very firm and hard, nodular, and bound down posteriorly. A chain of large soft glands extended along the whole length of the lesser curvature and was continuous with similiar glands in the gastro-hepatic omentum up to the hilus of the liver. The foramen of Winslow was patent but the lesser sac was divided into an upper and lower portion by adhesions running transversely and binding the lesser curvature to the posterior wall of the lesser sac. The greater curvature, opposite the ulcer was indented and drawn by the cicatrix up toward the lesser curvature; the lumen of the constriction would admit two fingers. The stomach was isolated from above and below, clamps applied, and the portion of stomach bearing the ulcer removed. The portion excised was two and a half inches along the lesser curvature and two inches along the greater curvature. The ends were united leaving a lumen capable of admitting all the fingers of one hand. Recovery was uneventful, drink and diet were allowed as controlled by the patient's appetite and she was discharged on May 28th.

Conclusion: Case 1 is illustrative of the text-book type of hour-glass stomach in which the symptoms are definitely obstructive and are due to the effects of a chronic ulcerative process with scar formation and contraction. Case 2 shows an earlier stage, one might term it "the formative period of an hour-glass contraction." The symptoms are those of an irritable stomach caused by an active ulcer. It also demonstrates (as shown by the radiograph taken immediately after ingestion of the Barium meal) that an ulcer occupying a small area is capable of setting up tonic contraction in the stomach wall producing spasmodic stricture or "spasmodic hour glass stomach." The importance of *x*-ray

examination of stomach conditions cannot be too strongly urged. In our opinion it ranks ahead of history and all other methods of clinical investigation.

4. Gastric ulcer with carcinoma, Dr. A. T. Bazin.

A. F., male, aged sixty-seven, admitted to Montreal General Hospital May 12th, 1914, referred by Dr. Robert Elder of Granby. Complaints: gastric distress, vomiting and emaciation. For twelve years has had "stomach trouble" characterized by burning in epigastrium, sour eructations and flatulence coming on one to two hours after meals, relieved by taking food or drink. For one year has had vomiting with more severe pain and an emaciation of 25 lbs. No hæmatemesis or melæna.

Examination reveals definite mass in epigastrium. Test meal shows food retention; free HCl present, acid content not determined as the meal met with an accident during the examination, no occult blood. Stool shows occult blood. Barium *x*-ray shows retention after six hours and ill defined duodenum and pyloric region. Diagnosis of duodenal ulcer was made.

Operation May 18th: Considerable amount of clear serous fluid in abdomen. Pyloric region occupied by a hard nodular mass firmly bound down to the head of the pancreas; pyloric ring was cirrhotic and stenosed. Along the lower border of the mass were a few enlarged lymphatic glands very hard and shotty. No glands palpable or visible along lesser curvature. The condition was undoubtedly a duodenal ulcer but with the shotty lymph glands and the presence of fluid in peritoneal cavity, the suspicion was aroused that there might be malignant change taking place. Pylorectomy performed the mass having to be cut away from the pancreas, incision passing through dense cicatricial tissue. The ends were closed over and a posterior gastro-jejunostomy done. The patient was up on the eighth day; discharged on the fourteenth day, eating well, no distress, and gaining strength rapidly. Pathological report showed carcinomatous condition present.

Discussion: Dr. J. M. Elder: I have had several cases of hour-glass stomach and I find that the treatment is to be varied with the condition one finds. Sometimes one may do a Heineke-Mikulicz gastroplasty and sometimes incise the whole lesion and do an end to end gastro-anastomosis. Again one may have to do a side-to-side anastomosis because you cannot sufficiently free the stomach posteriorly to do it otherwise. In all my cases of hour-glass stomach, except one, the deformity was due to ulceration. In that case the stomach was picked up by a ligamentous band of the right rectus muscle. I did not interfere with the hour

glass but did a posterior-gastro-enterostomy to the large pouch and the case went on very well. Before the days of bismuth meals and *x*-rays a diagnosis was very difficult, though with air inflation one can often make out perfectly well the two halves of a distinctly hour-glass stomach. With regard to the case of duodenal ulcer an interesting question has been raised. I have always felt that these ulcers are common, much more than the gastric ulcer. Mayo says when you are operating for gastric ulcer, always go the right of the median line because most of these are duodenal. The question as to what is the relationship between duodenal ulcer and carcinoma is one which arouses a very great deal of interest to-day. Moynihan does not believe that duodenal ulcer has much to do with the cancerous condition, but thinks that where you have carcinoma it has likely been carcinoma originally. On the other hand the only thing we do know about the etiology of cancer is that it follows upon irritation and, given a chronic irritation of an ulcer, one is strongly tempted to believe that carcinoma would be likely to develop upon the site of a chronic ulcer, as we know it does elsewhere.

Dr. F. B. Gurd: Does the absence or presence of hydrochloric acid in the stomach in these ulcerative conditions hold any significance now as to the innocence of the growth?

Dr. J. M. Elder: I have records of thirty-five cases of stomach that I have operated upon and in all cases the same routine was followed, testing always for the presence or absence of HCl, and I do not think that one can attach the slightest importance to either its absence or presence as indicating a concerous condition or otherwise.

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THE first regular meeting of the society was held Friday evening, October 2nd, 1914, Dr. W. F. Hamilton, president, in the chair.

The retiring president's address was read, also a report from the secretary for the past session.

Dr. G. E. Armstrong gave an account of the meeting of the Congress of Surgeons and Dr. W. Grant Stewart of the transactions of the British Medical Association. The meeting took the form of the usual annual smoker, the members providing their own materials as it was the wish of the society that the sum usually expended on this meeting be sent to the Red Cross Society.

It was also recommended that during the term of service of those members who had volunteered for active service, the society carry such members without payment of dues. The members of the society were also unanimous in offering their services free to the families of those who had gone to the front.